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THE AGRICULTURAL STUDENT.

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V. H. DAVIS. C. L. SHUCK. C. W. EDDY.

EDITORIAL ETCHINGS.

With this issue the fifth volume of the Agricultural Student is completed. We feel that it has been a successful year for us all, and that we have made some advances in the general character and make-up of our paper. We wish to thank our friends for the many kindnesses that they have seen fit to confer upon us, and we hope for a continuance in their favors. Trusting that we may experience in the future the same good treatment we have received in the past, we make our bow before the curtain goes down upon the last act.

In this, our last chance at our readers for this year we wish to drop a farewell word for a most admirable organization—the Agricultural Student Union of Ohio. This organization has been rebuilt during the past winter and the outlook is indeed encouraging. As most ex-students, alumni and friends of the university are aware, there are now six departments in the Union, as follows: agriculture, horticulture, dairying, apiculture, economic botany and soils. Each of these departments is under the supervision of a director, whose duty is to see that all who carry on experiments are supplied with materials. These materials are all supplied through the experimentalist, who is located at the agricultural experiment station at Wooster.

The spring circulars have been out for some time, and several hundred have been sent out to different persons over the state. The number of favorable replies that are being received is quite flattering.

And now, friends, we feel that we are safe in saying that this experimental union, itself somewhat of an experiment, has come to stay. The good that it is possible to accomplish through it is incalculable. Will you be one of the pioneers in the movement? Do you care to hold back and let some one else start it up, and put it on its feet, or would you like to share the glory of being among its first members? If you wish to learn anything further concerning it write to the secretary, John F. Cunningham, Horticultural hall, Ohio State University, Columbus, O.

Do you see many well kept country cemeteries in your neighborhood? I think I can see you look surprised, meditate for a moment, and then answer, "Not many." It seems that the average country cemteries are literally "places of the

dead." The dead see nothing, and thus it is folly to put much time and trouble upon improving the appearance of their resting place,—this seems to be the philosophy of many. But think for a moment what the influence of a well kept cemetery upon a community must be.

Beauty itself will ever be uplifting, and where beauty is connected with such tender sentiments as hover about the resting places of the departed its effect upon the soul is indeed sweet; we must remember that the departed leave friends behind them.

There is much change of late in the condition of village cemeteries, which has no doubt been effected by the example of the larger towns. It is to be hoped that the village example will in turn affect the rural communities.

Some weeks ago the civilized world waited breathlessly from day to day for news from the bedside of a well known author. The people seemed to recognize what it would mean if Rudyard Kipling were to pass away.

Instead of being a mere writer of novels, as we are wont to consider him, he is a student of more profound subjects. He is a balance wheel acting upon the rampant progress of the white race. He seems to place himself entirely outside of the maelstrom of the business and political and fighting world, and to look in upon the operations of men with a supremely observing intellect. In two of his poems he has gone to the heart of humanity, and he recalls mankind to a thoughtful standstill concerning questions that had charmed the nations and made them wreckless.

In his poem, "The Recessional," he brings exultant Britain to an attitude of submission with the retrospection:

"Lest we forget, lest we forget."

In "The White Man's Burden" he appeals to the whole world of thought and progress. He calls attention to the fact that by reason of undisputed superiority the white man virtually controls the world. He has inherited the world, and his is the supreme will. Often he has come into possession of territory and power through unjust means, and out of justice to himself and his God he must bear the burden of his inheritance. Of this great responsi- Kipling writes:

"Take up the white man's burden!
  You dare not stoop to less,
Nor call too loud on freedom
  To cloth your weariness.
By all means you will or whisper,
  By all means you will or do,
The silent, sullen peoples
  Shall weigh your God and you.

"Take up the white man's burden!
  Have done with childish days,
The lightly proffered laurel,
  The easy, ungrudged praise;
Comes now to search your manhood,
  Through all the thankless years,
Cold, edged with dear-bought wisdom,
  The judgment of your peers."

Frosts.

Plants lose their heat principally by convection and radiation. By convection fresh portions of air are being continuously brought into contact with the plants, and if the air is the cooler the plants will lose their heat until both the air and the plants are the same temperature. This occurs on windy nights. On still nights plants lose their heat by radiation. The rays of radiant energy move away in straight lines and pass freely into space unless checked and turned back by some object,

either clouds or by some artificial covering; water appreciably retards it. If the sky is clear the surface of the earth and plants gradually become cooler, and the air near the surface is cooled by being in contact. As the air cools it becomes denser, and it then ranges itself in layers according to density, the denser air being at the bottom. This is why frosts occur in valleys while the upper slopes are not touched. The thermometer in this case frequently shows a variation of from 5 to 10 degrees in only a few feet of elevation.

The cooling of the air continues until condensation of the watery vapor begins. Watery vapor is always present in greater or less quantities. The temperature at which this condensation takes place is the dew-point, and if this occurs at 32 degrees Fahrenheit or below, frost is formed.

Before the vapor can be condensed it must lose an enormous amount of heat. To condense enough vapor to make one pint of water, enough heat will be evolved to raise more than five pints of water from the freezing to the boiling point. All this heat must be lost by radiation in order to form dew. Hence, when condensation begins the heat evolved practically prevents further cooling. The dew-point varies with the amount of moisture in the air, being higher the greater the amount of moisture present, but it is always constant for the same amount of moisture.

Radiation takes place more rapidly from the surface of plants than from the air about them, so that on very still nights the plants are sometimes several degrees colder than the surrounding air.

The conditions favorable for frost are:

(1.) Clear sky, because radiation of heat is rapid under these conditions.

(2.) Dry air, because dry air, cooling by radition, will continue to a lower temperature before it is checked by the heat given off by condensation.

(3.) Still nights, because under these circumstances the air arranges itself in layers according to its density. The colder and denser air collecting near the surface.

Professor Hammon of the United States Weather Bureau, in his bulletin on frost, gives five methods by which frost can be prevented or its effects diminished.

1. Diminishing the radiation of heat. This is accomplished by screens of either glass, cloth or lath, and by obscuration of sky with smoke made by smudge fires. Smoke has met with varying success. In the wheat fields of Dakota it afforded excellent protection, while the orchardists of Florida and California have not obtained such uniform success.

2. Raising the dew-point by adding moisture to the air, and thus making sensible the latent heat of condensation at a temperature above the danger point. By burning damp fuel, such as loose, damp straw or manure, bales of wet straw, or sacks of manure, the heat of the fire is taken up in evaporating the water, increasing the vapor in the air. When this vapor condenses all the heat used in forming it is set free upon condensation and tends to warm the surrounding air.

3. Adding heat to the air. This is done by directly heating the air by means of fires. This can be best done by having many small fires. Large fires heat the overlying air so rapidly that it rises and affords little protection.

4. Draining the cold air from the region needing protection. This method is used in valleys where, by building large fires at the lower end, cold air is warmed and draws in

other air in turn to be warmed, and hence getting the air in motion.

5. Mixing the air so as to prevent the cold air from sinking to the surface. While the preceding methods depend partly on this principle for their success, yet none of them depend solely upon it. C. N. MOONEY.

A Side Issue.

Nearly every farmer has some product to which he pays special attention, yet there are equally important crops, perhaps, which he overlooks.

The poultry industry of Ohio turns nearly three millions of dollars annually into the hands of its fosterers, although the average egg yield per hen in 1890 was below seventy. The greater part of this income is shared by farmers. What are the farmers doing to increase the income from this adjunct to their business?

No animal on the farm requires so little food, is so prolific, and yields such proportional returns, if well managed, and so gratuitous even if neglected, as the hen.

Two things must be known to determine the profit of an animal; first, cost, and second, income. On the farm, with its range, the cost of feeding hens need not be great. The income varies with the management of two factors: First, proper feed and care, and, second, proper breeding. Perhaps more may be accomplished by feeding than by breeding, but that certain traits can be perpetuated and improved by breeding, has been shown in nearly all lines of live stock.

A serious mistake is often made in selecting fowls for breeding and eggs for hatching. On many farms the custom is to select eggs for hatching during the spring months, when nearly all the hens are laying. And nearly every hen lays during these months, whether she has laid since the preceding fall or not. If size and early maturity are wanted, eggs from early maturing pullets of desired size, mated with a cockerel from a similar pullet, should be used. If eggs are wanted, and the profit in poultry has been decided in favor of egg-producing breeds, it is important to know exactly what the hens are doing in order to make a proper selection of breeders.

While it is not practical for the general farmer to keep an individual egg record, it is possible to have some means of knowing which are the earliest layers, and which lay best in those months when eggs are highest in price. Not all the pullets hatched from eggs of heavy layers will lay heavily, but it has been proven by many that a prolific strain can be produced. Mr. A. J. Silberstein of Massachusetts has a Light Brahma pullet of a strain that has been bred for egg production which laid 223 eggs within 277 days from laying maturity. If he has produced an egg-laying strain of such character, certainly we may at least improve our flocks. F. W. SCHAEFFER.

Rural Free Mail Delivery.

That the free delivery of mail in rural districts is a success and destined to become a permanent institution, is indicated by the action of the recent congress, which increased the appropriation for this work from $150,000 to $300,000. Wherever tried, especially in the eastern states, it has been satisfactory to the officials and the people.

The prevailing impression that rural free mail delivery is expensive is a mistake. In nine out of ten districts in which it has been introduced it pays its way; in some of them it yields a profit.

If the opposition of fourth-class postmasters could be overcome, and

members of congress were less afraid of the political effect of abolishing the fourth-class officer, rural delivery might be extended in many sections at less than the cost of the existing service. To be sure, every village of any size should have its postoffice. But the common country store and postoffice, lowering rather than uplifting the moral and social tone of the whole community, can well be replaced by rural free mail delivery.

The crowning difficulty of the free rural delivery mail, which comes before the department nearly every day during four to six months of the year, is the bad condition of the roads. The success of this undertaking depends on the good condition of the roads, and it would seem more consistent with good business practice, to first provide a safe and practical way over which the mails can be carried, instead of appropriating large sums of money for wading the mud of our country roads.

It is entirely within the power of the national government, and the people of the various states to hasten the correction of this existing evil. The government itself should have it clearly understood that the free delivery system will be promptly applied in the sections where the existence of good roads makes it possible. Where good roads are not maintained the free delivery of mails should not be attempted. The government can not successfully apply the system where the condition of the roads make travel difficult and at times virtually impossible.

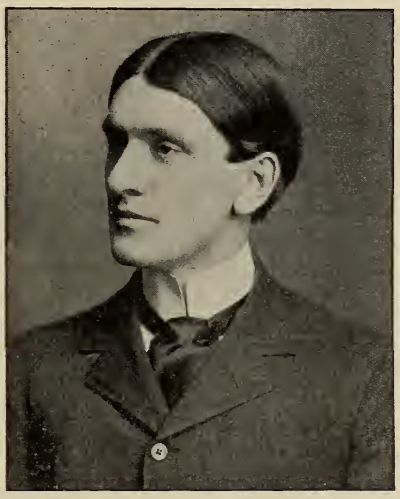
Let the first step toward securing the free delivery of mails be the bettering of the roads by those districts which desire its benefits. Both are for the best interests of the people, and the people should do their share of work necessary to secure the benefits.

V. H. DAVIS.

OUR SENIORS.

F. S. Johnston.

Frederick Symmes Johnston was born at Oberlin, Ohio, on the 20th of December, 1873. After completing his course in the common schools he attended Pierpont Academy, from which he graduated in 1892. During the remainder of 1892 and a part



of 1893 his time was spent in teaching and study. In the fall of 1893 he entered the Ohio State University, and will graduate with the class of '99. During his college career at the university Mr. Johnston has always been known as a public spirited student, and has ever been an enthusiastic supporter of student enterprises. His great interest in all legitimate endeavors has made him extremely popular among his fellows, and the high quality of his class room work makes him esteemed and respected by students and instructors alike.

Mr. Johnston is a member of Kappa Sigma fraternity and Townshend Literary society. He was one of the editors of the Makio for 1898. He has been upon the Agricultural Student magazine staff for some

years. Mr. Johnston is a young man of broad views, and we predict for him a successful future.

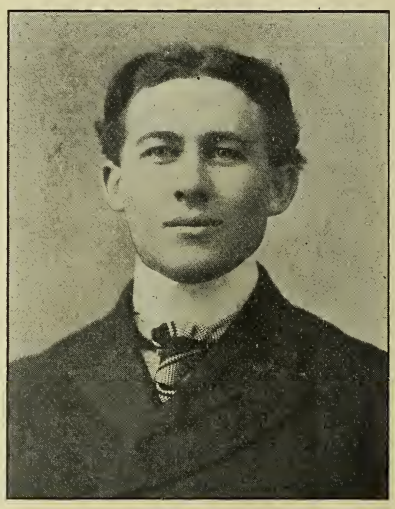
Thesis: "A Study of the Conformation of the American Trotter."

The practical work of this thesis was done in connection with Mr. C. K. McClelland as a joint thesis. In this thesis it is attempted to bring out some of the more prominent principles in the study of animal mechanics, especially in their relation to speed. Measurements of the head, members and various parts of the body were taken of each animal, and then comparisons made between different animals. The articular angles were measured for purposes of comparing the acuteness or obtuseness in their relation to speed. These different measurements have been summarized in tabular form, and some interesting results may be seen. For example, it is a commonly accepted belief that the distance of the body from the ground, immediately behind the forelegs, should be less than or equal to the thickness of the head to the body, that is, of measurements made on the American trotter this does not seem to hold good, in fact the opposite seems to be the true condition. It was found, however, that the common relation of the head to the body; that is, of 1:3, was nearly borne out by the evidence.

The principal object, perhaps, of the thesis was not to discover anything particularly new, but to verify what had been done and to apply these principles to a class of animals which had never before come up particularly for treatment in this way.

L. C. Warden.

Leonard Cahoon Warden was born at Avon, Ohio, May 8, 1875. He attended school at his native place until he was 15 years of age, and then went to Cleveland, Ohio, where he was engaged for two years by the firm of Root & McBride Bros. In the fall of 1893 he entered the Ohio State University in the short course in agriculture, and in the fall of 1894 he changed to the course in horticulture and forestry. He was out of college during the school year '95-'96, when he was engaged in the mill



business, representing H. J. Barrows & Co., of Lorain, Ohio. He is a member of Alpha Zeta fraternity, Townshend Literary society and Horton Literary society. In Townshend Literary society he has had several offices, including president during winter term of '99. He was secretary and treasurer of the Y. M. C. A., and first lieutenant in the University battalion. He played with the football team for two years and took some part in track athletics, entering the longer runs.

During the present year he has been steward of the North Dormitory, a position of honor and trust. For several years he has been connected with the Agricultural Student Magazine.

Mr. Warden is a man of good address and has good business ability.

Arthur Grant Abbott

Was born August 14, 1872, in Medina County, Ohio. He comes from New York parentage, his grandparents having come to Ohio in the early thirties. He attended district school until 16 years of age, when he entered the Medina High school. He graduated three years later with high honors in a class of fifteen. He then worked on the farm with his father until the fall of 1893, when he entered Oberlin college. He remain-

ed there for two terms and then returned home, expecting to enter O. S. U. in the fall, but on account of his father's heavy loss by fire he was prevented from carrying out his plans until January, 1895, when he entered the freshman year of the agricultural course.

In the spring of 1896 he accepted the position of farm foreman at Purdue university, which position he held for two years, and then returned to finish his courses at O. S. U.

Mr. Abbott has always been a prominent member of the Y. M. C. A. and Townshend Literary society. He is a member of Alpha Zeta fraternity, and is upon the editorial staff of the Lantern, the college paper.

Always upright, generous and affable and ever maintaining a high standard in his classes, Mr. Abbott bids fair to do honor to the name of the great institution which is soon to present him with its diploma.

PHENOLOGICAL OBSERVATIONS ON TREES.

(Joint Thesis by L. C. Warden and A. G. Abbott.)

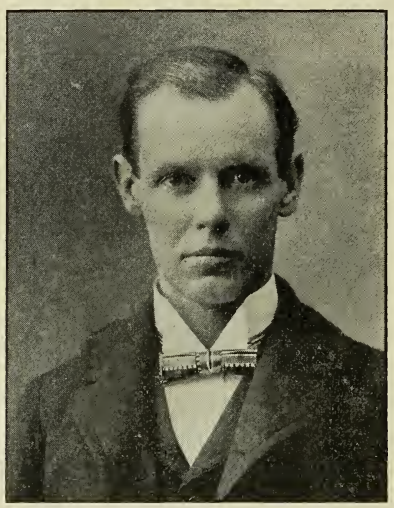
In this thesis we have carried on three distinct lines of observations. The purpose of these observations is to try and determine the relation of temperature and moisture to tree growth, and also the relation to durability and structure of the wood. The first observation was made upon seven different varieties of young trees. The object of this observa- was to determine at what time in the year the tree made its greatest growth, and what was the total amount of growth made for the entire growing season.

The second observation was made by taking some small twigs of the same trees that were in the first observation and determining the moisture content. The object of this observation is to determine at what time of the year the trees contain the most moisture, and what relation this moisture has to tree growth and hardiness.

The third observation was a temperature test made upon seven large trees of a different variety than the former. The object of this observation was to determine the difference between the outside and inside temperature of the trees, and the degrees of variations of temperature of different kinds of trees; also the temperature of the trees at the time in which growth begins.

Marion Imes

Was born at Laurel Furnace, Ky., on Sept. 3, 1873. When 5 years old he came with his parents to Ohio. At the age of 12 years, upon the death of both of his parents, he was thrown upon his own resources, and since that time he has been fighting his own way.



In the fall of 1894 he was granted the free scholarship in agriculture from Meigs county, and entered the Ohio State university at that time.

Throughout his college career Mr. Imes has been greatly admired by all who know him for his ability to make things go. He has made his way entirely, working in the University dairy through the school year and during the summer. He was foreman of the dairy for some time, and when the bottling of milk was begun in the new Dairy Laboratory he was placed in charge of that department.

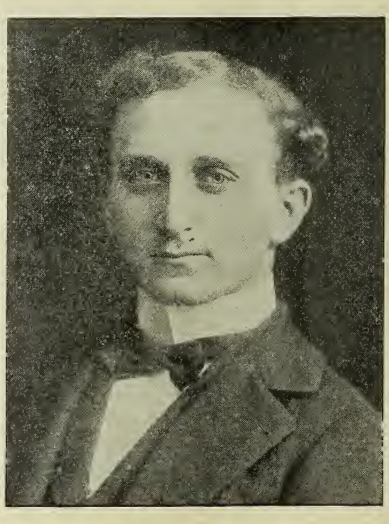
Mr. Imes is an excellent student, having made a specialty of subjects relating to dairying. During the last term he was one of the instructors in the Ohio Dairy school.

He is a member of Alpha Zeta fraternity and Townshend Literary society. From what he has accomplished thus far we must prophecy that Mr. Imes will reach a high plane in his chosen line, and that his relation to the dairy interests of the country will one day be greatly appreciated. His sterling qualities can not go without recognizance.

C. A. Clawson

Was born August 2, 1873, at his country home in Butler county, O., where he spent his early days working on the farm in summer and attending the district school in winter, until the year 1890, when, on account of delicate health, he was persuaded to accept a position in town for a short time.

In the fall of 1892 he graduated from Centerville (Ind.) High school, receiving the certificate of honor, which entitled the holder to a four year free scholarship at Adrian college, Michigan.



In the fall of 1894 he entered O. S. U. with the intention of taking not more than two years' work. In 1899 he graduates with 240 hours credit, having completed more work than than his course requires.

He is a member of Alpha Zeta fraternity and of Townshend Literary society, where he has held all of the offices in the society except secretary and librarian.

Mr. Clawson has always been a prominent member of the Y. M. C. A. For some years he has been foreman of the horse department on the University farm, a position of some responsibility.

Mr. Clawson is a hardworking and successful student, as is shown by the fact that he has far more than completed his course. If he employs the same faithful tactics after leaving college, he will surely make himself a place in the world.

THE EXTERNAL CONFORMATION OF THE DAIRY COW IN RELATION TO HER MILK AND BUTTER PRODUCING POWERS.

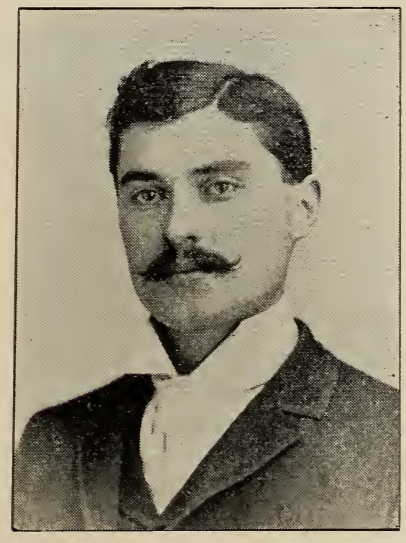
(Joint Thesis by Marion Imes and C. A. Clawson.)

In collecting the data for this work about fifty-five cows, selected from the leading herds of the state, were scored and measured in detail, and their milk and butter production recorded. These figures will be so tabulated as to bring out the relation existing between the different types of cows and their powers of production. Each detail measurement is compared with the milk and butter product, thus indicating their significance and the points indicative of a typical dairy cow.

Oscar Erf.

Oscar Erf was born on the 17th of December, 1874. Most of his life has been spent upon the farm in connection with dairy work. His schooling was received in the district school, and later, at the age of 9 years, he entered the Monroeville High school, from which he graduated in 1892.

He worked one year for his father after leaving school, and then, upon his father's death, he was engaged with his brother upon a dairy farm for a year, when he received an appointment to a free scholarship in



agriculture in the Ohio State University. In the fall of 1894, then, he entered the freshman year of the course in agriculture. During the winter term of that year he completed the special course in dairying, and such a thorough and careful student did he prove himself that when the dairy school was opened next year he was selected as assistant to the professor in charge. Since that time he has been a regular instructor in the Dairy Laboratory, during the special dairy course.

At the close of the winter term in 1895 Mr. Erf accepted a very good position as instructor in a creamery in the western part of the state.

In his class room work he has always been careful and reliable, and his genial manner makes him well liked by all with whom he is thrown in contact. During his college course he has superintended the erection and equipment of three large creameries.

He is a member of Alpha Zeta fraternity and Townshend Literary society. He has contributed liberally to the Agricultural Student Magazine.

Mr. Erf leaves the university with an excellent training in dairy, creamery and cheese factory work, and his valuable experience in erecting and equiping factories of this kind will make him in demand.

THE ECONOMIC APPLICATION OF ARTIFICIAL REFRIGERATION IN CREAMERIES.

This thesis is being prepared in conjunction with Messrs. Huntington and Gamper, seniors in mechanical engineering.

The object of this investigation is to determine, if possible, the relative cost, on a creamery scale in Ohio, of artificial refrigeration to that of ice. The tests are being made with the refrigerators of the Ohio Dairy School, and consist of determining the efficiency of boiler, engine and compressor, and the heat units removed from the refrigerator. Having the amount of cold produced by a ton of ice, the comparative efficiency of the artificial refrigerator is expressed in these terms.

Some of the Boys.

Where they are and What they Are Doing.

About the middle of April the editor of the Student conceived the idea of making the last number of the Student more of a personal number than is usually the case. With this in view, especial efforts have been exerted to find out what former students are doing, and where they are located. We have received quite a number of letters from the "old boys," and parts of them may be reproduced here:

I, with my two brothers, am running a 160-acre fruit and truck farm. Have between 25 and 30 acres of crimson clover (catch crop) to plow under. We have been growing and sowing our own seed for five years, and each year it seems to do better, verifying acclimation.—M. J. Persing, ex-student class '98, Clyde, O.

May 1 ends our connection with Gratiot creamery. Will engage in dairy farming with my brother, under name of Baer Bros., Canal Dover, O. Please send the "Student" to me (May number), to Canal Dover. Yours truly,

PHILIP BAER, JR.,
Gratiot, O. *Class* '97.

I completed the special course in dairying in the spring of 1897. The following spring, May 10, 1890, I purchased a retail route in the city of Toledo, and make a trip daily, driving the wagon myself. We are trying to sell everything, farm and all and locate in Virginia; if we do will try and let you know what success we have there. I anxiously await the paper and hear from the other boys. R. F. CASS.
Maumee, O.

This winter I have been feeding cattle and trying to keep warm. I have been trying to feed up some bull calves. We have a fine lot of calves this spring, and we will try and show something good in the calf line this fall at some of our fairs. We are somewhat behind in our spring work, but that is a general complaint in our section of the state. I am going to have my hands full this summer looking after the cattle. Wishing you success, yours respectfully, E. C. DARLING.
Nellie, Ohio.

I am on the home farm and getting ready for the spring crops. Would have graduated this year had

I continued, providing there would have been no flunks to my credit.

F. C. BALL.

Mt. Vernon, Ohio.

H. D. Bowsher, ex-1900, is engaged in the sheep industry at his home near Buckland, Auglaize Co., O. H. D. is erecting elegant buildings on his 180-acre farm, and he simply smiles upon being asked, "What does it all mean?"

I am helping on the farm with my father this year in general farm work. I entered O. S. U. with the class of 1900, but expect to return to O. S. U. next year to complete the course with the class of "01."

F. W. DITTO.

Delphos, Ohio.

I am farming in eastern Muskingum county, near Gratiot, Ohio. If I had gone on through I would have graduated in the class of '97. I only took the 'short course." I have been farming ever since I left the University. W. C. HAMILTON.

Brownsville, Ohio.

I would say that I am still eking out a precarious livelihood in the garden business in this place. I have recently purchased 15 acres of ground and expect to build soon. It may be news to some of my old friends and classmates to learn that I am a Benedict of over a year's standing. Perhaps I ought to add that the "precariousness" mentioned above is in no way due to this latter fact. SHERMAN HOOD, '94.

Meander, Ohio.

The personal news as regards myself since leaving the O. S. U., from which institution I graduated with the degree of B. Agr., in June, 1891, is as follows: 1892 took post-graduate work at Cornell in Horticulture, securing the degree of M. S. in June of that year. In September, '92, elected as Horticulturist to the West Virginia Agricultural Experiment Station; in 1893 was elected Professor of Agriculture and Horticulture in the West Virginia University, together with the former work in the Experiment Station; in August, 1895, was elected Professor of Agriculture and Horticulture in the New Hampshire College of Agriculture and the Mechanic Arts, also Agriculturist and Horticulturist in the Experiment Station. On Sept. 15, 1898, the chair of Agriculture and Horticulture was divided and I retained the chair of Horticulture, which I now fill. The Horticulture work in the West Virginia University and Experiment Station, as well as that in the institution with which I am now connected, was organized by myself. The West Virginia State Horticultural Society was formed through my efforts when connected with that state. Besides a great amount of teaching work I have managed to publish more or less bulletins each year from experimental work, which I have found most attractive and a wide field. Very sincerely, F. WM. RANE.

New Hampshire College of Agriculture and the Mechanic Arts, Durham, N. H.

Graduated with the class of '95. Am now vice president of the Lawrence Publishing company, publishers of the "Ohio Farmer," of Cleveland, and the "Michigan Farmer," of Detroit. I wish to congratulate you upon the very readable magazine that you are issuing, and you certainly should meet with hearty support at the hands of the University, the alumni and former students. M. W. LAWRENCE.

Cleveland, O.

I am now located at Ludlow, O., and am a member of the firm of Eli Duncan & Sons. We make a specialty of evaporating sweet corn and growing strawberries. Had I continued at the O. S. U. I would have graduated in 1902. Wishing the Agricultural Student success, I am, very truly, D. H. DUNCAN.

I am at present associated with my father in the management of the farm, which is conducted as a general stock and grain farm. We have just finished one of the most productive maple sugar seasons for many years. It is generally said that a good sugar season will be a poor wheat season, but this seems to be an exception, so far at least, as wheat is looking better than usual for the time of year. Meadows are rather poor owing to the severe winter. Spring's work backward.

Medina, O. A. W. NETTLETON.

I have been at home for a short time and have just engaged to operate the creamery in Hartsgrove this season. This creamery is under the management of The Edwin E. Rick Co. of Pittsburg. Will you kindly send the next two numbers of the Student to Hartsgrove instead of Mesopotamia? With best wishes to yourself and success to the Student.

S. D. AYERS.

Hartsgrove, O. Ex-member class '97.

One of my brothers and I are running the home farm on the shares. We are not growing rich very rapidly but we expect to stay with the farm. Had you not requested a brief reply I would like to tell you why I have sought no other field of employment; why I prefer real farming to any other occupation; why I think there is as great and important field of labor in our isolated rural communities as there is in stations for graduates of agriculture; why every student who begins a course in agriculture at O. S. U. should make every effort to complete the long course, and a dozen other things. But this is too long already and I must close. M. R. SHELLABARGER.

Garland, Ohio.

I am at home on the farm near Nevada, engaged in general farming, cattle and sheep as the principal live stock. Am trying to put in practice some of the things I learned while attending the O. S. U. I would have graduated with the class of 1900 had I continued my college work. I still have a desire to finish my course.

Nevada, O. F. S. ATEN.

My present address is at Milan, and my occupation is that of farming. I would have graduated with the class of '98.

PRESCOTT MILLIMAN.

Milan, Ohio.

I am in the employ of two firms. The first is that of Garber, Reist & Co., of Detitz and Stevens, Lane Co., Pa., with the main office at this place, manufacturers of the celebrated E. D. (Elm Dale) butter of the Philadelphia markets. The second firm is that of Emigsville Creamery Co., of Emigsville, Pa., manufacturers of fine pasteurized dairy products, butter, cream and milk. I am employed in the work of instructing the operators in the employ of the two firms, in pasteurizing, and am fitting up the factories for that work. Will be with them until the close of the present year, when I expect to return to O. S. U.

Delitz, Pa. WILLIS G. HARRY.

C. K. McClelland, '98, after leaving school, served with the Fourth Ohio Volunteer Infantry in the Porto Rican campaign, enduring the vi-

cissitudes and trials through which that regiment passed and sharing its glory. Since leaving the U. S. service he has been at home on the farm at Andover, O., where he may be found hard at work.

Mr. Geo. A. Flickinger, '98, is at home at present, helping his father with his spring work at York, O.

Charles W. Burkett, '95, is now Professor of Agriculture in the New Hampshire College of Agriculture and Mechanic Arts. Professor Burkett has good experience in his work at the Ohio State University, and we hear excellent reports from him in the east.

Homer C. Price, '97, is at Cornell University, where he has held the fellowship in agriculture during the past year. Mr. Price writes us that he expects to return to the farm next year.

I am now acting in the capacity of associate agriculturist for the college and station. Am commandant of the Cadets. Assist in the teaching of agriculture and am instructor in geology and physical geography. The Board of Regents allow me two months this summer to be spent in the Department of Agriculture, Division of Soils, Washington. Will probably remain here another year. I am glad to note that the Student is advancing in interest and usefulness. I have renewed my subscription for the next year. Yours very truly, J. H. BONE.

Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma.

From Kingston, Ohio, R. W. Dunlap, '95, writes us as follows: "Am still on the Congo stock farm, and am trying to make it go and think I am succeeding. I do general farming, with draft horses and shorthorn cattle as a specialty. There are 300 acres in the farm and it is all very fine and tillable land. Am very busy."

President Osborne.

Thomas Mott Osborne, president of D. M. Osborne & Co., is the only son of the late D. M. Osborne, the founder of the business. He was born in Auburn, N. Y., in September, 1859, two years after his father had started the manufacture of mowers and reapers. He received his education in the public schools of Auburn, at Adams Academy, Quincy, Mass., and at Harvard University, whence he graduated in the class of 1884.

He at once entered the office of D. M. Osborne & Co. as a clerk, and subsequently served as assistant superintendent. Upon the death of his father in July, 1886, he was made president of the company, and since then he has worked steadily in its service.

Mr. Osborne has traveled much in foreign countries, both during and since his school days, making the tour of the world in 1877-8.

In politics Mr. Osborne is a National Democrat. He represented his district in the Chicago convention of 1896, but surrendered his credentials upon the adoption of the platform, and subsequently was sent as a delegate to the Indianapolis convention. In the fall of 1898 he was the candidate of the Citizens' Union for lieutenant governor on the Independent ticket.

He has represented the Auburn Business Men's association at both sessions of the Indianapolis monetary convention.

Mr. Osborne has been much interested in educational matters. He was thrice elected to the Auburn Board of Education, serving for

nine years. He is a trustee of Wells College, Aurora, N. Y., and president of the Board of Trustees of the George Junior Republic of Freeville, N. Y. He has within the past year been a lecturer in the department of political economy at Cornell University. He also served for two or three years as one of the vice presidents of the New York State Agricultural society. He conceived the idea of what is known as the "Osborne Prize Contests," at the Ohio State University, College of Agriculture, and still supports them.

In 1886 Mr. Osborne was married to Miss Agnes Devens of Cambridge, Mass., a niece of James Russell Lowell and also of Judge Charles Devens of the Massachusetts supreme court, attorney general in the cabinet of President Hayes. Mrs. Osborne died three years ago, leaving to her husband the care of their four boys.

The business that is unwilling to trust itself in the hands of the people ought not to exist.

Tuberculous Cattle.

(Result of Post Mortem Held at Ohio Experiment Station, April 11th, 1899.)

The majority of these cattle had reacted to the tuberculin test in June, 1897, and have been injected with tuberculein at intervals of a few months ever since that time to test the power of tuberculein as a therapeutic agent in the disease. The test included 15 head, of which 12 were killed on the 11th, the killing being public, the post mortems being conducted by Dr. White of the O. S. U. veterinary department. The following are the results, the number of the animals are those given them in the bulletin to be issued by the Experiment Station:

No. 2.—Holstein cow, 5 years old; highest reaction, 105.4; condition fair; no tuberculous lesions found on post mortem.

No. 3.—Shorthorn cow, 11 years old; highest reaction 106 deg. F.; condition excellent; the animal was badly tuberculous in lungs and lymph glands of the thorax and mesentery.

No. 4.—Red Polled cow, 9 years old; reaction 106 deg. F.; condition very poor; the cow was badly affected, tuberculous lesions being found in almost all organs; some of the abscesses were encapsuled and cuneous.

No. 5.—Polled Angus cow, 10 years old; reaction 107 deg. F.; condition splendid; the lymph glands, liver and udder of the cow were badly affected.

No. 6.—Jersey bull, 5 years old; reaction 106.6 deg. F.; condition splendid; lymph glands of pharynx affected, and old abscess found encapsuled in liver.

No. 7.—Polled Angus heifer, 3 years old; reaction 104 deg. F.; condition excellent; small tubercles in mesenteric lymph glands and pericarditis also present.

No. 8.—Red Polled heifer, 3½ years old; reaction 106.8 deg. F.; condition splendid; retropharyngeal lymph glands affected, also pericarditis present.

No. 9.—Holstein heifer, 2½ years old; reaction 105.2 deg. F; condition fair; portal glands enlarged, small nodules throughout small intestine; pericarditis also present.

No. 10.—Holstein bull, 18 months old; reaction 107 deg. F.; condition good; mesenteric lymph glands enlarged and hard nodules throughout small intestines.

No. 11.—Red Polled calf, 18 months old; no reaction; condition good; no tuberculosis found; the calf had been fed milk from tubercular cows.

No. 12.—Holstein cow, 3 years old; reaction 104 deg. F.; condition poor; mesenteric glands enlarged and nodular throughout small intestine, but not thought to be tuberculous.

No. 13.—Red Polled heifer, 2 years old; reaction 104 deg. F. and unsatisfactory; condition good; small bowels were nodular as in preceding case.

In addition to these cattle, four hogs, eight months old, two of which had been fed raw tubercular milk and two fed the same milk pasteurized, were killed, and all four were very badly tuberculous, abscesses and tubercles being found in almost every organ, showing that the milk was not rendered sterile or that the infection had come from some other source. All the cattle killed, with one exception, were registered stock which had been bought for breeding purposes. In most every case the meat of these cattle was fit to use, as the disease was confined to internal organs. Eight guinea pigs were inoculated, some of them with tubercles from animal No. 12, to determine if these nodules were tubercular or parasitic. These little animals will be killed about June 11th and the post mortems will be reported in the Agricultural Student next fall.

Duplicity of Cases.

The duplicity of cases brought to our clinics is really remarkable, and is of such regular occurrence that whenever an unusual case is brought in we always feel confident of having a duplicate brought in within a very few days. Sometimes there is an explanation for this, but more often it is purely a coincident. Sometimes, instead of merely duplicates, three or four and sometimes more cases of a similar nature are brought in for treatment. Just at present we are treating fistulas of the withers, having three patients thus affected in the hospital at present writing, and to illustrate the duplicity two of the patients are colts. A history of a few of these cases of unusual conditions would perhaps be of interest. Last October a fine gray mare belonging to a railroad man was brought to our clinic. She was suffering from a fistula located just below the annular cartilage of the ear. An operation was advised and performed, the animal making a perfect recovery. A few days later another horse, also a gray and owned by a railroad man, was brought in suffering from exactly the same trouble, the fistula being in exactly the same locality as in the other case. The same operation was performed, but the case did not yield as readily to treatment, and the animal is still being brought to our clinic. Late in the fall we had three cases of quittor under treatment at the same time. Quittor is an exceedingly obstinate thing to treat and takes a month or more at least to accomplish anything like a cure, while others will take three months or longer, and in this respect these

cases differed widely, one healing in about five weeks, one was sold to us as an anatomy horse, the owner not being willing to bear the expense; the other was taken away by the owner, who had become discouraged at the slow progress made. Two gray horses were brought to us on the same day by different parties, both horses being affected with melanotic tumors peculiar to gray horses. On two succeeding days last fall horses were brought in from Dublin and Marble Cliff in wagons, neither animal being able to walk. They were taken away within a day or two of each other in the same way, both on the high road to perfect recovery. On the 15th of last month two horses were driven in by their owners, both suffering from colic. These cases were brought in within ten minutes of each other.

BOOK REVIEWS.

ELECTRICITY IN TOWN AND COUNTRY HOUSES: Percy E. Scrutton; cloth; illustrated; pp. 150; Macmillan Company, New York; $1.00.

This little book is one of the extremely practical kind that are written for use and not for show. The object of the writer is to set before the people "in a popular form, the many uses to which electricity can be put," about the house, to serve the inhabitants in many ways. No technicalities are entered into, but the details of handling electricity are given with scientific accuracy, and the explanations are greatly assisted by the pictures with which the book abounds. There are 77 pictures in the book, illustrating the apparatus, machines, batteries, methods of wiring, etc.

It is a very complete work and will be useful to those who have means to afford electricity about the home.

CORN PLANTS; THEIR USES AND WAYS OF LIFE: Frederick Leroy Sargent; cloth; pp. 106; illustrated; Houghton, Miffin & Co., Boston.

A book for young people (and old people as well) and students who are taking up the elementary principles of plant study. It is primarily a book for supplementary reading, along with text book work.

From his position as a teacher in Botany in some of the leading colleges of the land, Mr. Sargent is well qualified to present a treatise upon this subject.

The author's main purpose seems to be to create new interest in the study of plants, and to bring them closer to our daily lives. Not only is the history of corn plants given, but the increased relation between corn plants and man from the remotest ages is nicely told.

The book is largely illustrated by the author from nature. It is a very readable book and contains much information in an easily available form.

THE ODONATA OF OHIO: David S. Kellicott, Ph. D.

We have lately received a copy of the work of the late Professor D. S. Kellicott upon the dragon flies of the state. The book is published by the Ohio State Academy of Science. There is a short prefatory note by Professor Herbert Osborn, in which he explains that most of the paper is just as Professor Kellicott left it at the time of his death, and that such descriptions as were unfinished were completed by Mr. J. S. Hine. The drawings are by Mr. W. E. Kellicott.

A biographical sketch (prepared by Mr. Hine) appears, with a picture of the author. To this sketch is added a list of the many papers which Professor Kellicott had furnished to the various periodicals.

Besides the complete descriptions, a key for identification is furnished, and a thorough index.

LANDSCAPE GARDENING AS APPLIED TO HOME DECORATION; Samuel T. Maynard; cloth; pp. 340; illustrated; John Wiley & Sons, New York; $1.50.

In this work Professor Maynard points out in a clear and happy manner how the people of this country may beautify their homes. Unlike most works on landscape gardening, it deals with the ordinary American home, its needs and requirements, and suggests in a sensible and practical way methods of improving and decorating the grounds and buildings.

The great fault with most writers upon landscape work is that they deal with parks and large public gardens, great estates, etc., and that thus their suggestions are out of the question for the ordinary householder. But as is shown by the author's dedication, this work is for "the thousands of home makers, who are trying to beautify their own homes, and thus adding much to our already beautiful and prosperous country."

In his treatment of the subject the author is quite complete. Beginning with a chapter upon "Landscape Gardening," and another upon "Ornamenting New Homes," he takes the reader through the steps in home decoration in logical order. Preparation of the land; trees, their planting and care, shrubs, walks, drives; renovating old homes and improving them, are all ably treated. A chapter is devoted to "Insects Injurious to Ornamentals," and another to "The Home Fruit Garden."

It will be seen from this brief survey of the book that it is especially valuable to the housekeeper, and the untechnical horticulturist and farmer. While all statements are scientifically accurate, they are clear and plain.

The book is very well illustrated with upwards of one hundred and sixty pictures, and through the agency of pictures and text combined one gets a clear understanding of the author's meaning.

Our opinion of the book is that it is an unusually valuable and useful work, and should be in the library of all gardeners, farmers and home owners.

THE ADIRONDACK SPRUCE; Gifford Pinchot; cloth; pp. 158; illustrated; The Critic Company, New York.

While this excellent little book is a study of the forest in Ne-ha-sa-ne Park, it is at the same time an extremely practical and useful book for lumbermen and foresters. The author asserts in his preface that his intention has been to make the book a useful one.

Far from being, as might be supposed, a theoretical forester's guide, or a botanical discussion, the book is extremely practical, and unless demanded for proof or explanation, all technical references are omitted. One of the author's aims is to bring into correct relations lumbering and forestry. Heretofore the persons interested in forestry have looked upon the lumberman as a vandal who was undermining the country's welfare. But as Mr. Pinchot says, "the lumberman and forester are as necessary to each other as the ax and its helve. Without the ax the helve has little weight; without the helve the ax is lacking both in reach and in direction."

The book presents many valuable tables of volume, yield, etc., and gives methods of survey, forest treatment, cutting transportation, and other useful knowledge.

It is a good book for lumbermen, foresters and students.

ELEMENTARY METEOROLOGY; by William Morris Davis; Ginn & Company, Chicago; introduction price, $2.50.

This work is believed to be opportune, since no elementary work on the subject has been issued in this country for over a quarter of a century. It represents the modern aspects of the science. It is adapted to the use of students in high schools, academies and colleges, who have already some knowledge of elementary physics, and who wish to gain a general understanding of the processes of the atmosphere.

The leading features of the book are: Full consideration of atmospheric convectional processes, from those of local occurrence to those of world-wide circuits; graphic illustration of the changes of temperature in vertical currents; simple determination of the share of gravity at work on baric gradients to cause the winds; due consideration of the effect of the earth's rotation in deflecting the course of the winds and in determining the general distribution of atmospheric pressure; deliberate examination of the leading theories of cyclonic action; explanation of the cyclonic control of weather changes.

The great and popular interest and the high educational value of Meteorology have been carefully borne in mind in the preparation of the book.

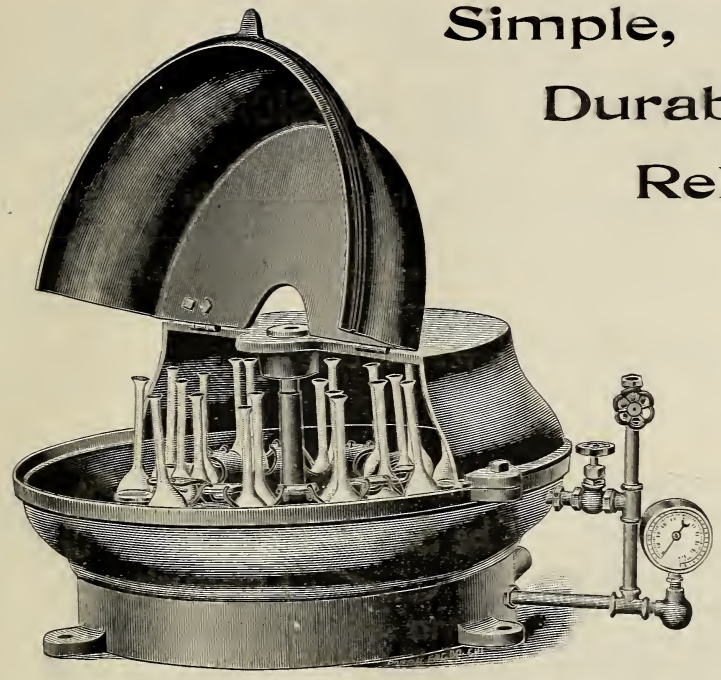
HOW TO KNOW THE FERNS: Frances Theodora Parsons; cloth; pp. 215; illustrated; Charles Scribner's Sons, New York.

This neat volume will first attract attention by its appearance. Its brown cloth cover is daintily decorated with green fern fronds and green and gold lettering, making a very pretty combination indeed. The text of the book is presented in a very happy manner, and instead of feeling that he is wading through a heap of scientific dry bones, the reader is impressed with the fact that he is following an attractive story.

Scattered through the book are many pretty quotations from writers upon nature; Thoreau and others upon nature, Thoreau and oth- objects to be loved and admired, rather than to be dissected and studied. While the descriptions are all correct, according to botanical custom, and many of the illustrations diagramatical, the intention seems to be to treat ferns as a "hobby," the following of whose path will bring happiness and pleasure.

The illustrations consist of pen drawings and photographs and are very good. To read the book and see the splendid pictures makes one feel like starting out at once with staff and camera. A very attractive and instructive book.

The catalogue recently issued by the U. S. Butter Extractor Co. of Newark, N. J., is one of the most artistic and beautiful specimens of workmanship in that line that we have had the pleasure of seeing. The company makes a specialty of the manufacture of high grade hand power cream separators. They make the following special claims for their machines: Best material, simple and quickly understood, perfect skimming, ease of running, smaller diameter and greater length of bowl, all combined with the lowest prices in the market for equal service. One of the features of their machines, and one that is fully guaranteed by the company, is that of economy of power in running. They guarantee their separators to run with about half the power of other machines of the same capacity. Those who are interested in cream separators would do well to write the company for their new catalogue.



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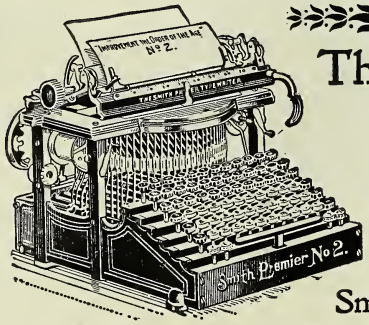

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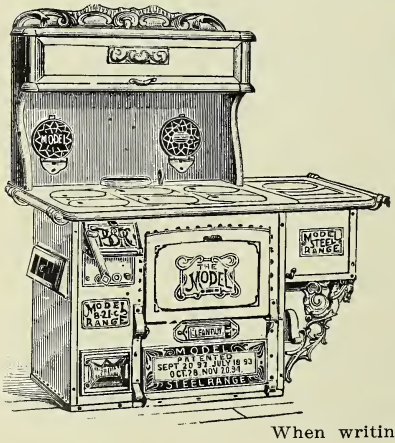

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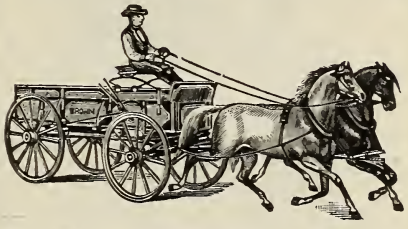

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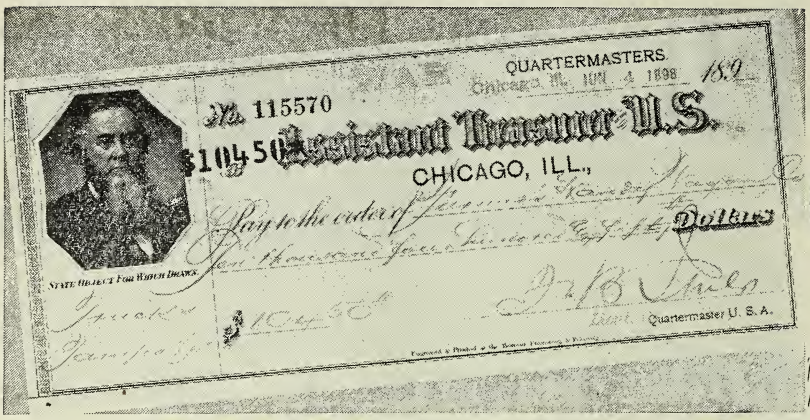

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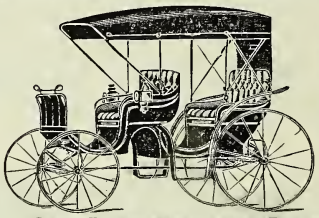

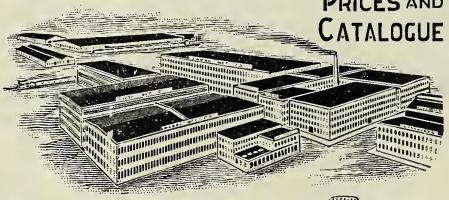

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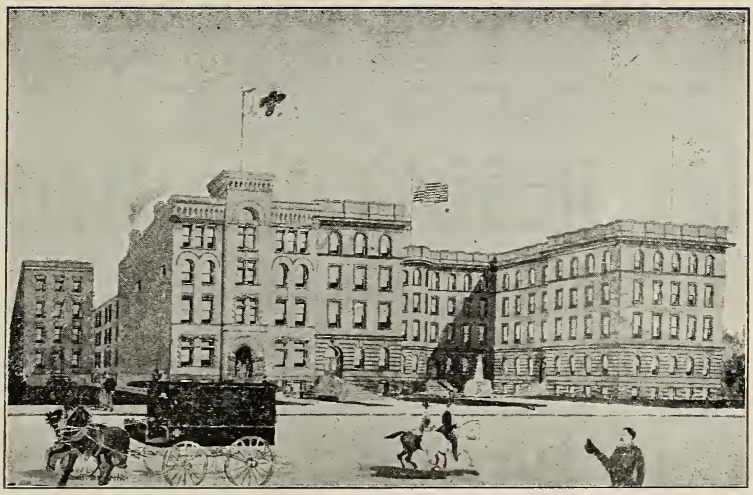

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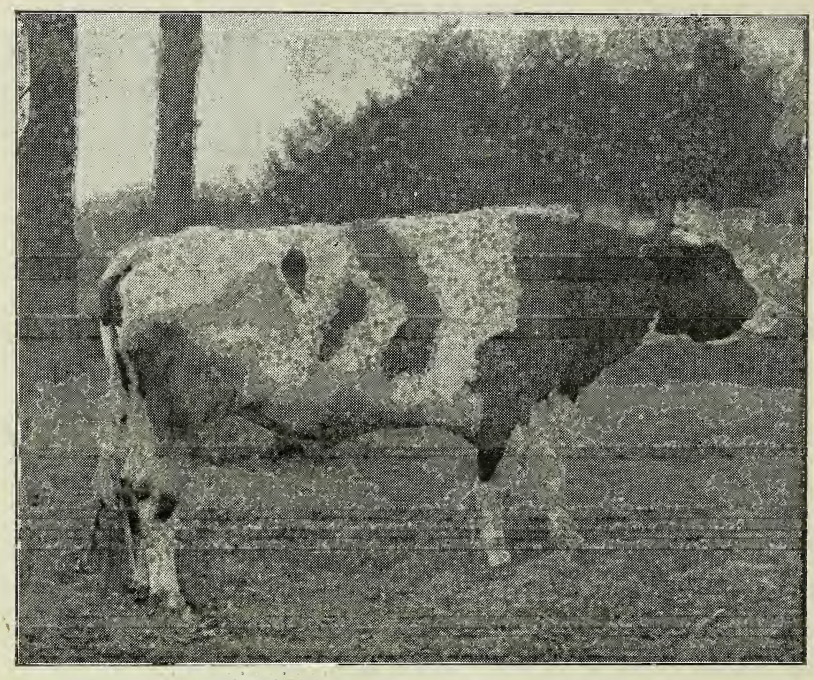

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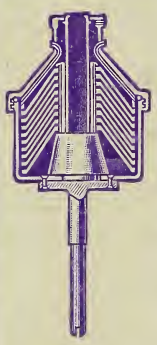

FIG. 1.

The Differences between Cream Separators

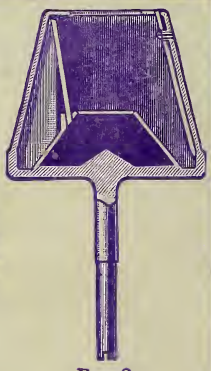

FIG. 2.

The cut on the left (Fig. 1) is that of a De Laval "Baby" separator bowl. It is of the improved "Alpha" disc type, which *protecting patents* prevent the use of in any other machine. It subjects the milk to centrifugal force *in thirty thin layers*. In consequence it has an actual capacity of 750 lbs. per hour, at a speed of 6,000 rev., and recovers 99 per cent. of the butter-fat in the milk. It is mounted within the finest operating machinery years of experience and the best of everything can produce.

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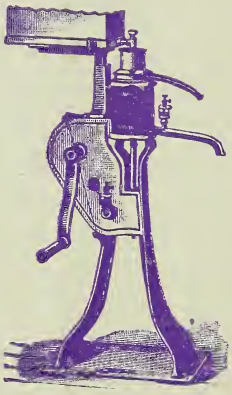

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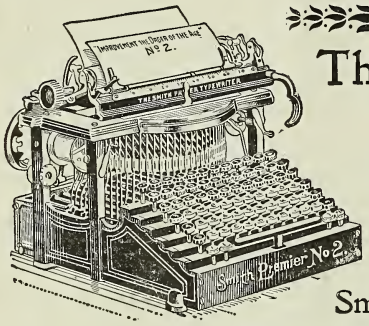

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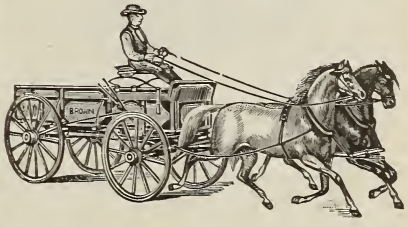

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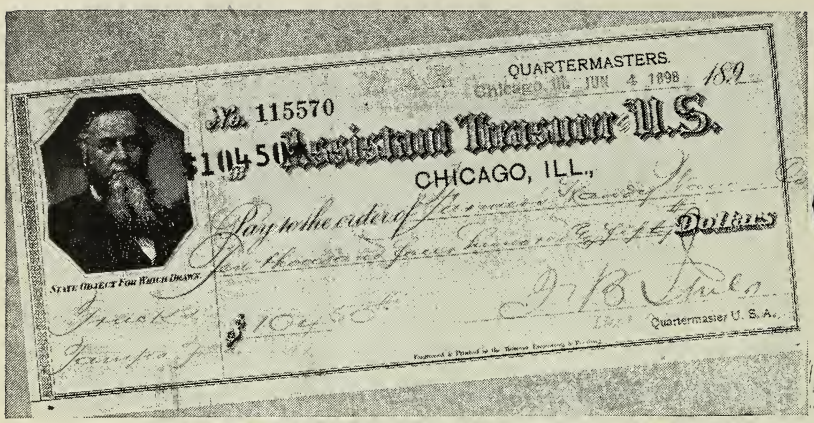

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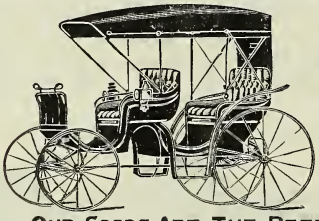

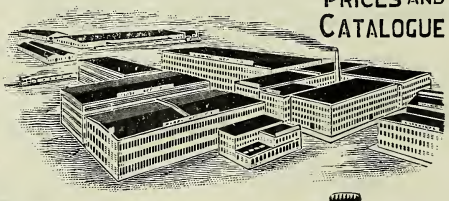

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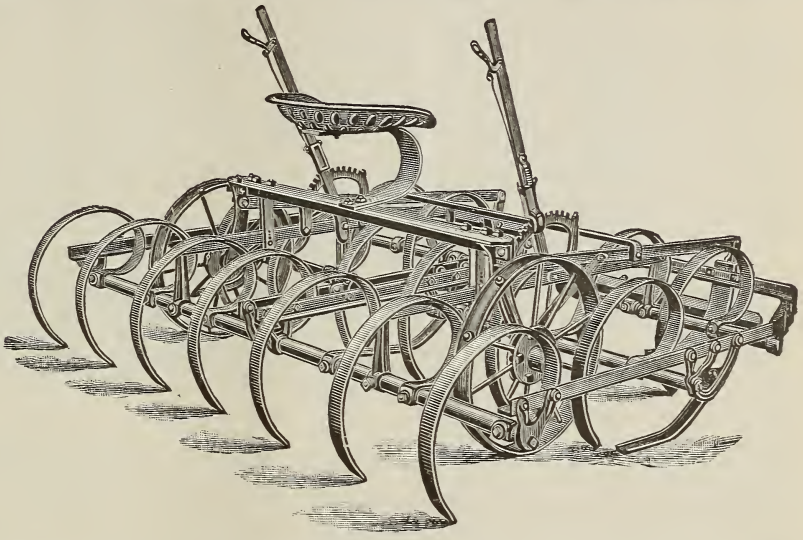

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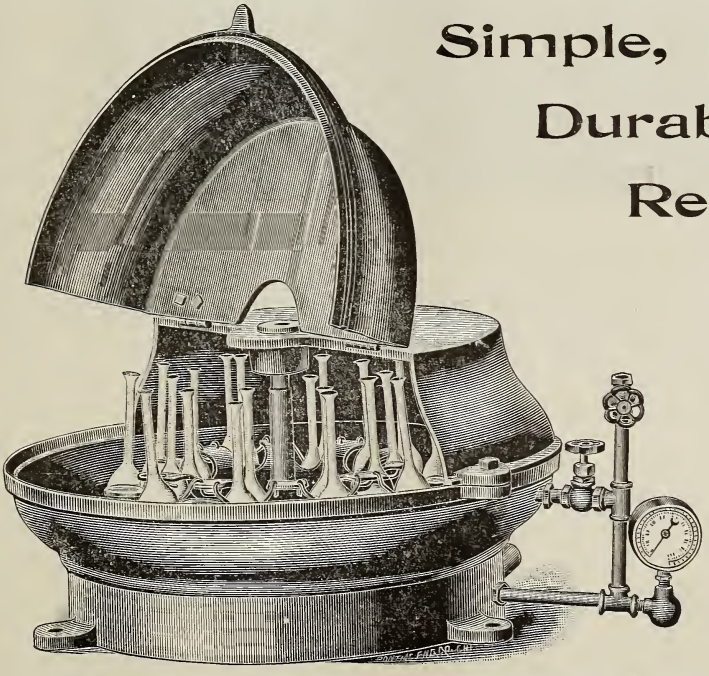

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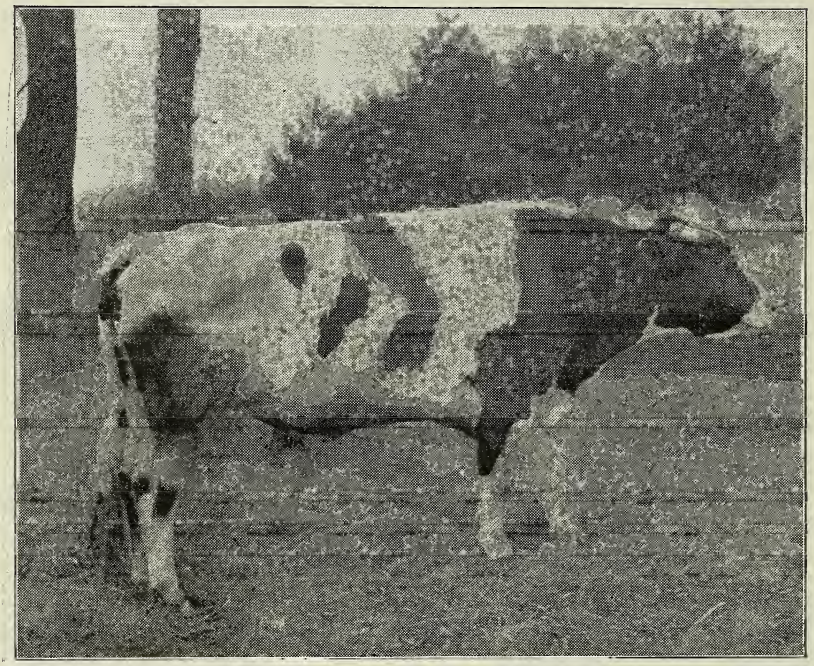

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Fig. 1.

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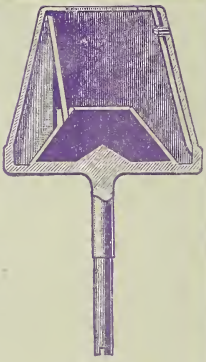

Fig. 2.

The cut on the left (Fig. 1) is that of a De Laval "Baby" separator bowl. It is of the improved "Alpha" disc type, which *protecting patents* prevent the use of in any other machine. It subjects the milk to centrifugal force *in thirty thin layers*. In consequence it has an actual capacity of 750 lbs. per hour, at a speed of 6,000 rev., and recovers 99 per cent. of the butter-fat in the milk. It is mounted within the finest operating machinery years of experience and the best of everything can produce.

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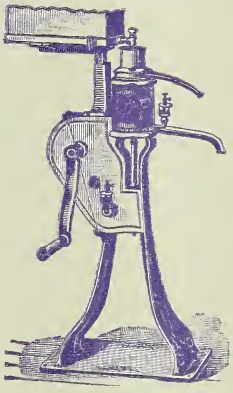

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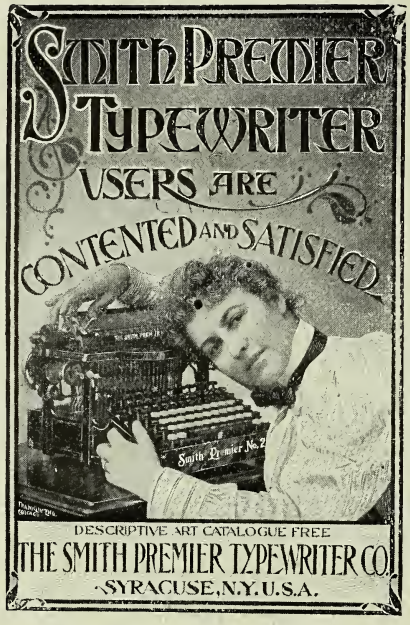

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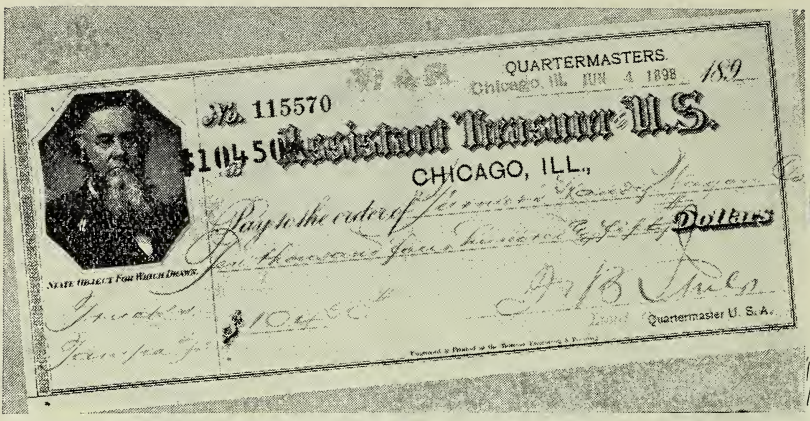

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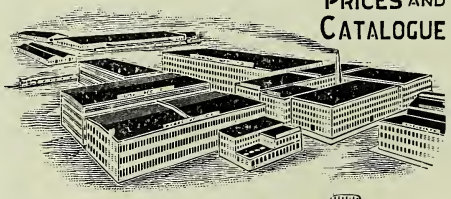

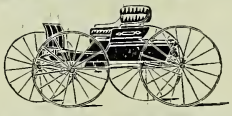

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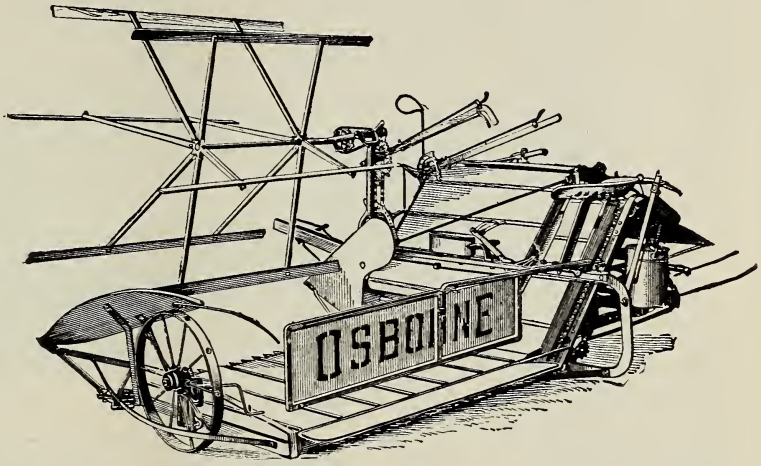

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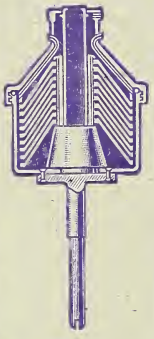

FIG. 1.

The Differences between Cream Separators

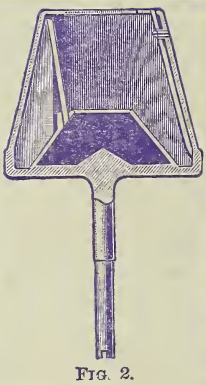

FIG. 2.

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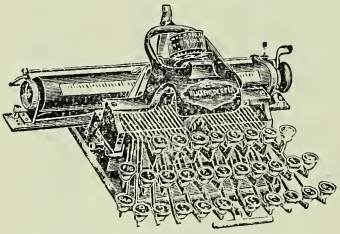

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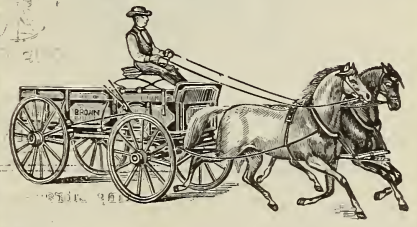

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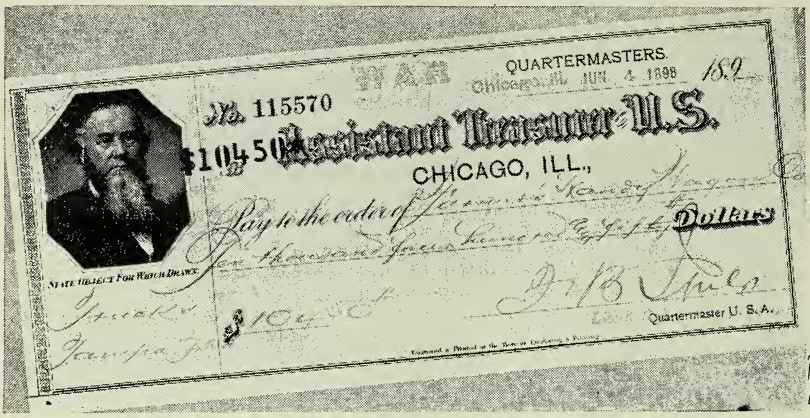

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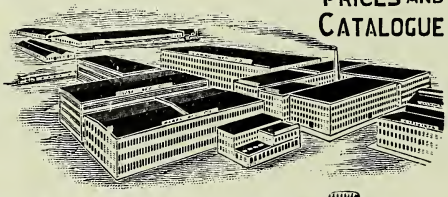

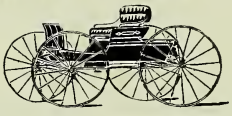

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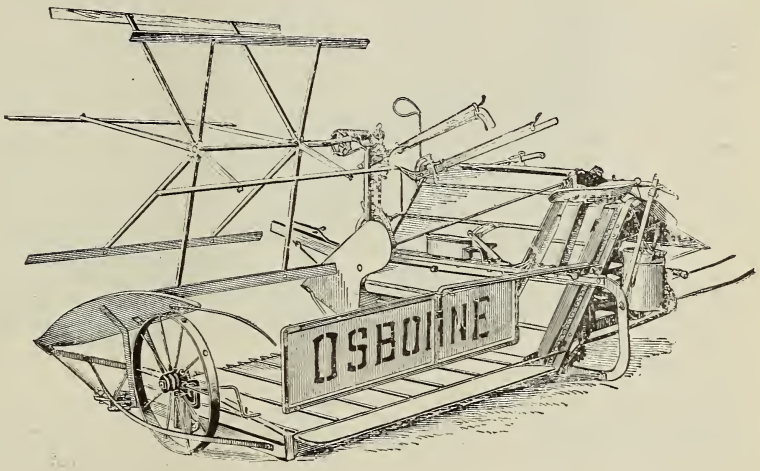

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Vol. V. JANUARY 1899. No. 8.

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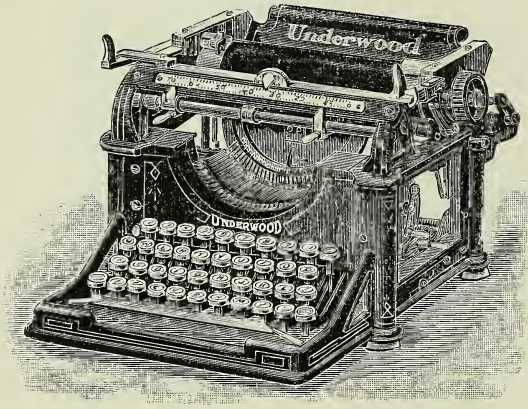

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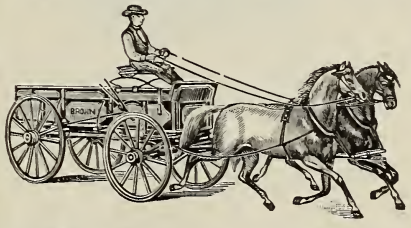

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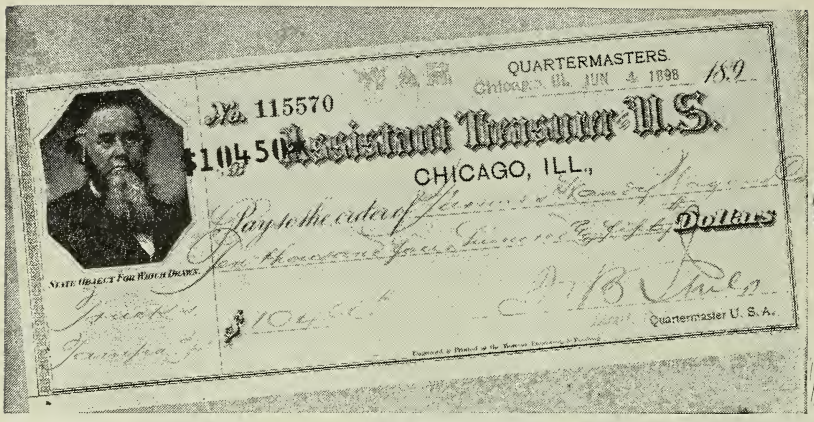

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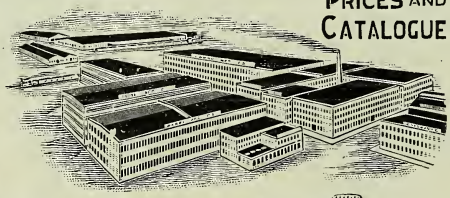

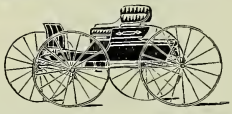

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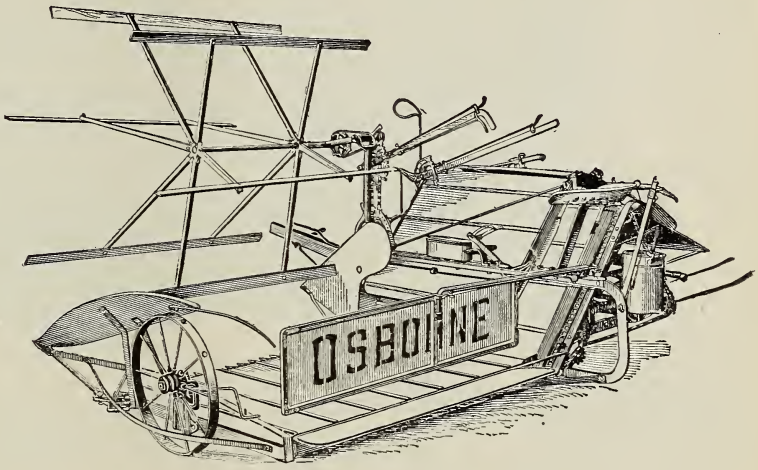

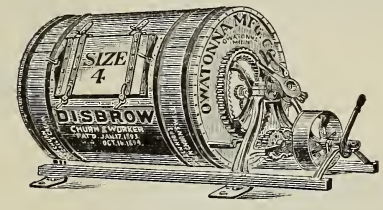

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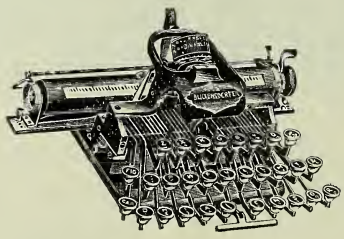

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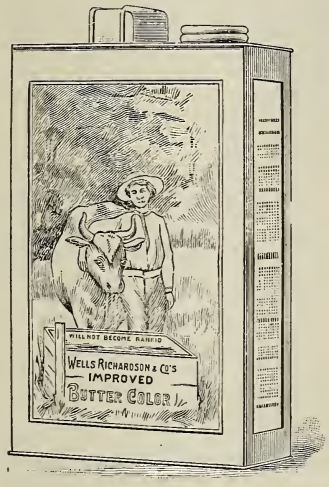

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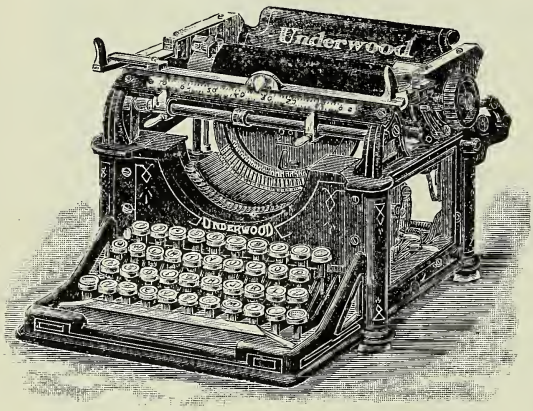

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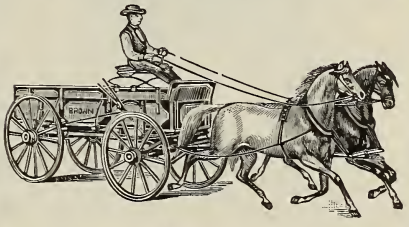

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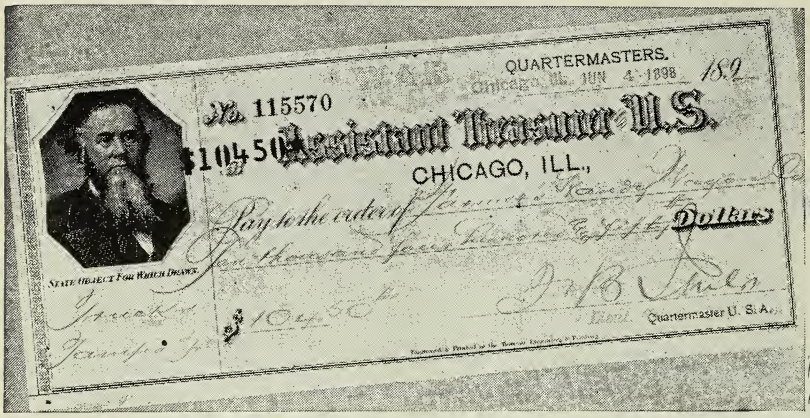

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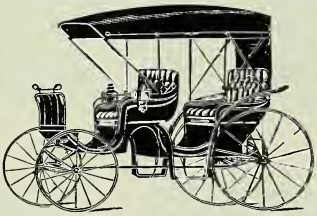

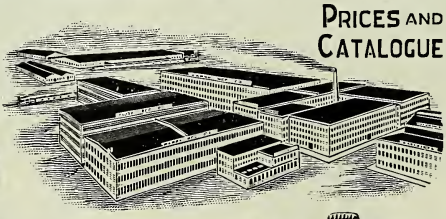

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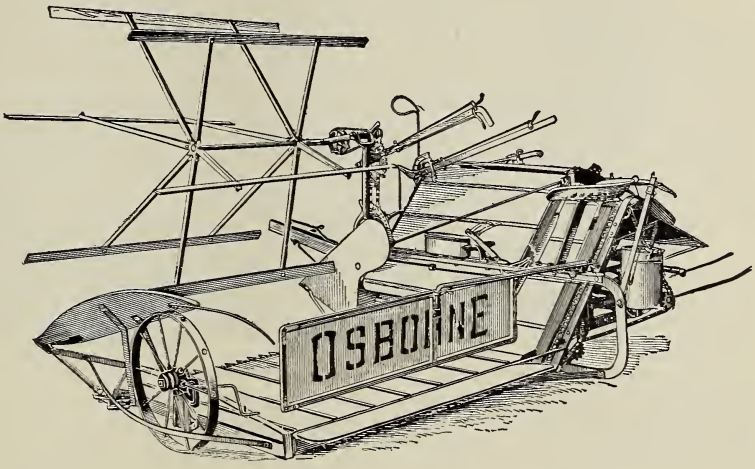

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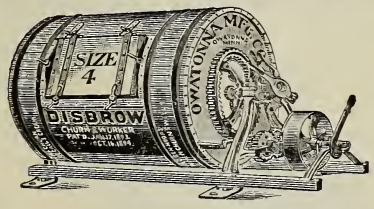

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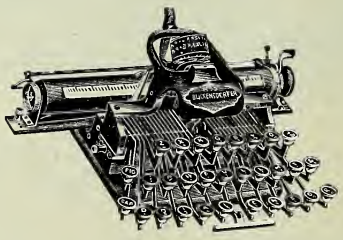

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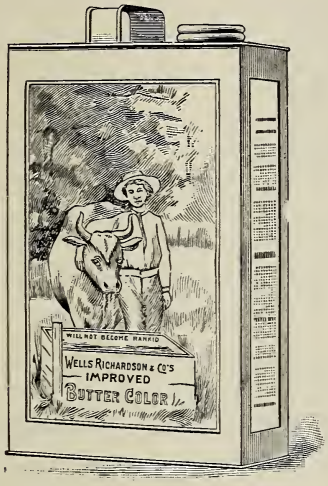

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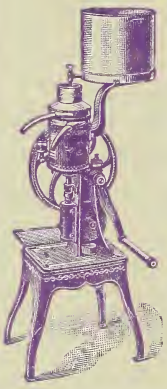

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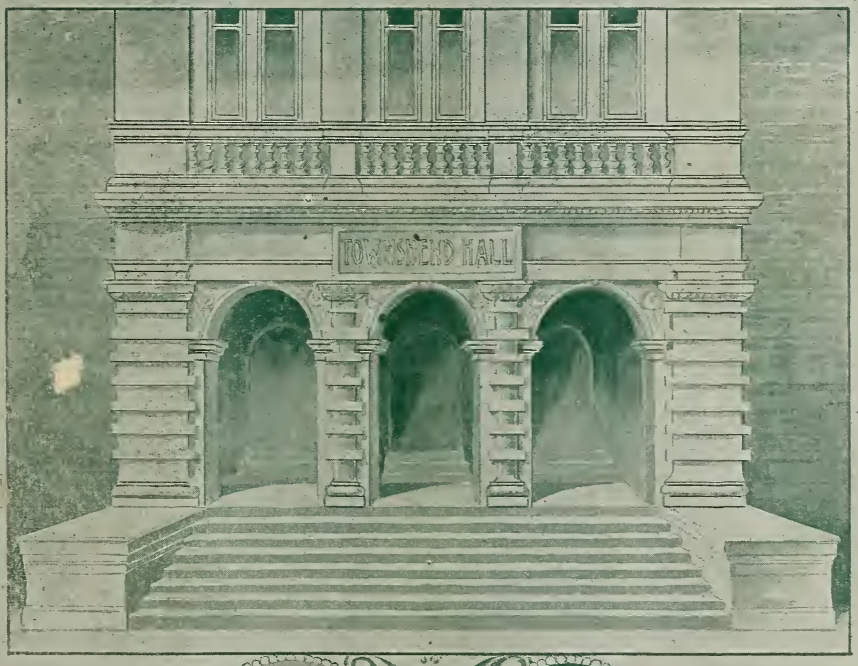

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The average of 19 consecutive tests of skimmilk, covering 13 days work in January, at the Massachusetts Experiment Station was .033 of 1%.

The average of 18 consecutive tests at the Vermont Experiment Station from January 9th to February 3d was .038 of 1%.

The average of 17 tests at the Wisconsin Experiment Station from January 2d to 19th was .03 of 1%.

Making an average from 73 tests of skimmilk of .034 of 1%.

To show that it is nothing unusual for the Improved U. S. Separator to do such close skimming, we add a few of the many letters received from those using the machine every day of the year, by which you will see that it does equally good work in the Dairy and Creamery.

Runs Quietly. Skims to a Trace.

Phalanx, O., Jan. 27th, 1899.

The No. 1 U. S. Belt Separator that I am using runs very quietly, and in all my tests as to skimming, I have never found only a trace of fat in the skimmilk. As to capacity am satisfied it is equal to any.

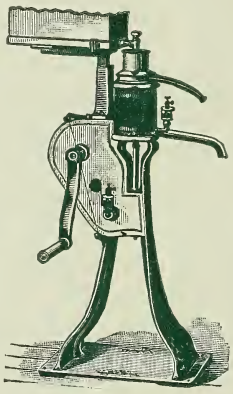
O. F. IVES.

Skims Clean and to Full Rated Capacity.

Sennett, N. Y., Dec. 21, 1898.

The two No. 1 U. S. Separators purchased last April have been running ever since and are giving the best of satisfaction. We are using four of your machines at present and have no trouble in making them skim up to their rated capacity and only leave .03 and .04 of 1% of fat in the skimmilk by the double neck bottle. The expense for repairs is very small.

W. E. SPURR,
Manager Sennett Creamery.



Seven Reasons Why He Likes the Improved U. S.

Mountain Lake, Minn., Feb. 6, '99

Since I am using a No. 5 Improved U. S. Separator on the Fairview Farm, will drop you a line to let you know that I am more than pleased with it. It is set up in the barn, and although the weather has been as cold as 35° below zero, still I find that it does its work and gives satisfaction, for:

First, it turns easily. Second, it skims so as to leave only .03 of 1% fat in the skimmilk as shown by the Ohlsson bottle. Third, the capacity is all that you claim for it. Fourth, it will skim as cold milk as any separator made. Fifth, my wife says it saves much labor and makes the care of the milk one-half lighter, and she can clean it in five minutes. Sixth, I have no trouble in flushing the bowl. Seventh, it is durable and easy to wash.

CHAS. McCROSSEN,
Manager Fairview Farm.

No Trace of Fat in the Skimmed Milk.

Tolt, Wash , Jan. 23, 1899.

The No. 3 Improved U. S. Separator I bought of you May 1st, 1898, and used by the Tolt Separating Co., has given perfect satisfaction. We have tested the skimmed milk with the Babcock Tester often, and have never found a trace of fat in it. The cream we ship to the Duwamish Milk Co. has given perfect satisfaction.

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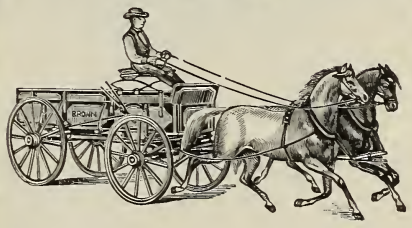

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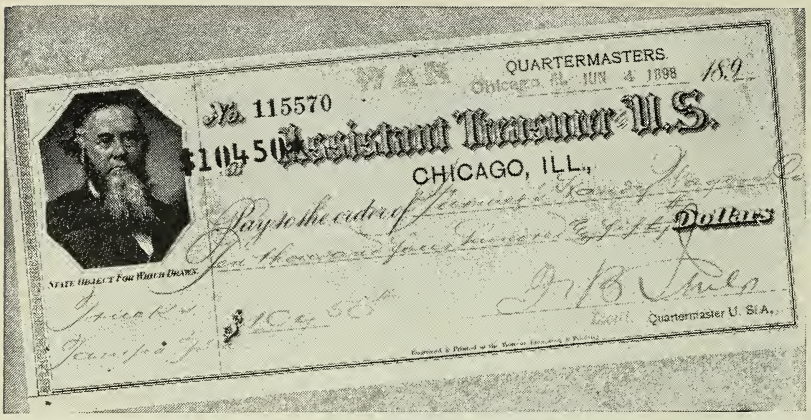

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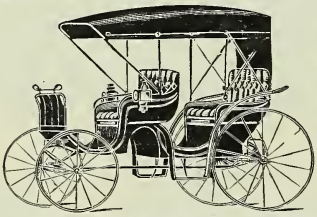

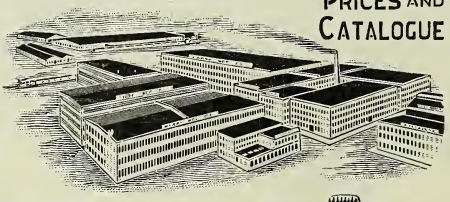

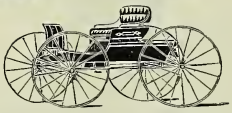

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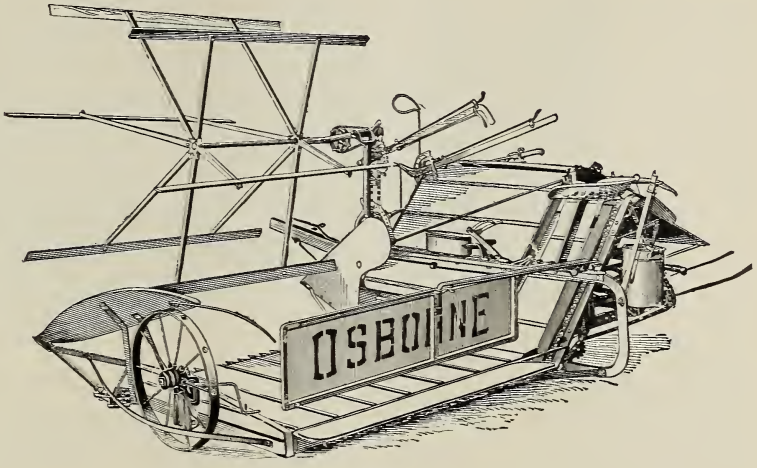

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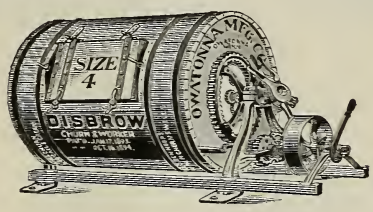

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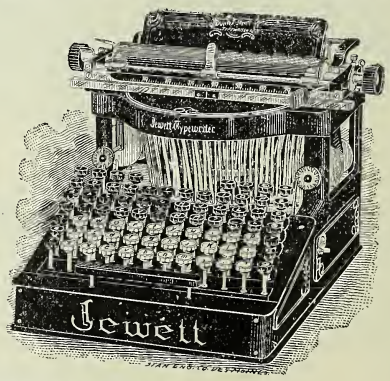

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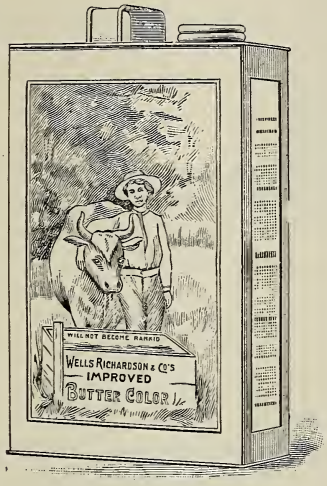

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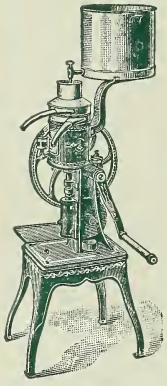

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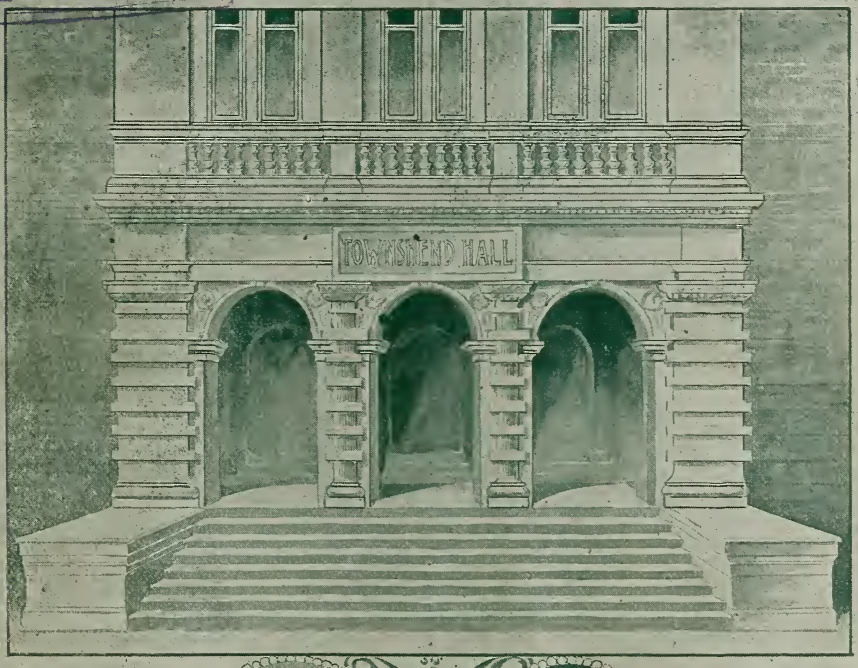

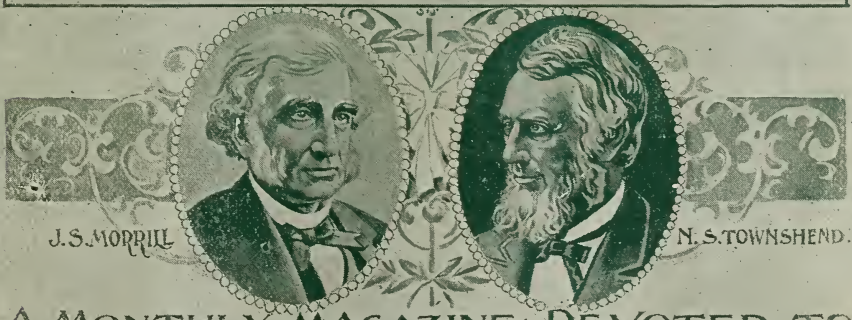

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The average of 18 consecutive tests at the Vermont Experiment Station from January 9th to February 3d was .038 of 1%.

The average of 17 tests at the Wisconsin Experiment Station from January 2d to 19th was .03 of 1%.

Making an average from 73 tests of skimmilk of .034 of 1%.

To show that it is nothing unusual for the Improved U. S. Separator to do such close skimming, we add a few of the many letters received from those using the machine every day of the year, by which you will see that it does equally good work in the Dairy and Creamery.

Runs Quietly. Skims to a Trace.

Phalanx, O., Jan. 27th, 1899.

The No. 1 U. S. Belt Separator that I am using runs very quietly, and in all my tests as to skimming, I have never found only a trace of fat in the skimmilk. As to capacity am satisfied it is equal to any.

U. F. IVES.

Skims Clean and to Full Rated Capacity.

Sennett, N. Y., Dec. 21, 1898.

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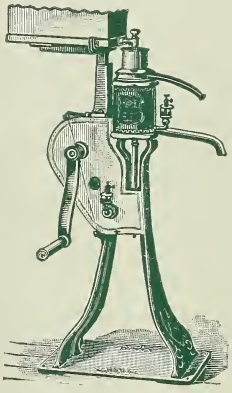
W. E. SPURR,
Manager Sennett Creamery.



Seven Reasons Why He Likes the Improved U. S.

Mountain Lake, Minn., Feb. 6, '99

Since I am using a No. 5 Improved U. S. Separator on the Fairview Farm, will drop you a line to let you know that I am more than pleased with it. It is set up in the barn, and although the weather has been as cold as 35° below zero, still I find that it does its work and gives satisfaction, for:

First, it turns easily. Second, it skims so as to leave only .03 of 1% fat in the skimmilk as shown by the Ohlsson bottle. Third, the capacity is all that you claim for it. Fourth, it will skim as cold milk as any separator made. Fifth, my wife says it saves much labor and makes the care of the milk one-half lighter, and she can clean it in five minutes. Sixth. I have no trouble in flushing the bowl. Seventh, it is durable and easy to wash.

CHAS. McCROSSEN,
Manager Fairview Farm.

No Trace of Fat in the Skimmed Milk.

Tolt, Wash , Jan. 23, 1899.

The No. 3 Improved U. S. Separator I bought of you May 1st, 1898, and used by the Tolt Separating Co., has given perfect satisfaction. We have tested the skimmed milk with the Babcock Tester often, and have never found a trace of fat in it. The cream we ship to the Duwamish Milk Co. has given perfect satisfaction.

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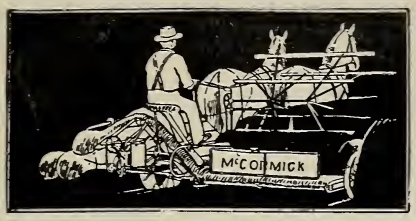

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Light Draft,
Most Durable,
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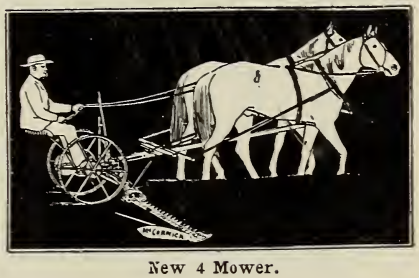

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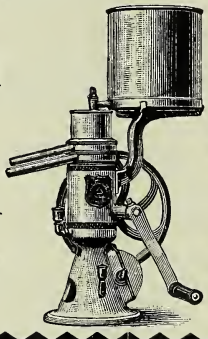

to run 50 per cent. easier than others of equal capacity. Their record for clean skimming is unequalled. We have the most complete line of hand separators in America; also power machines.

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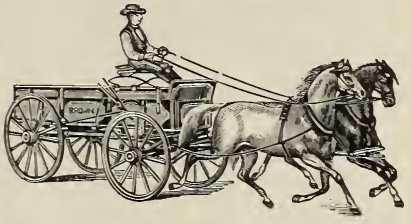

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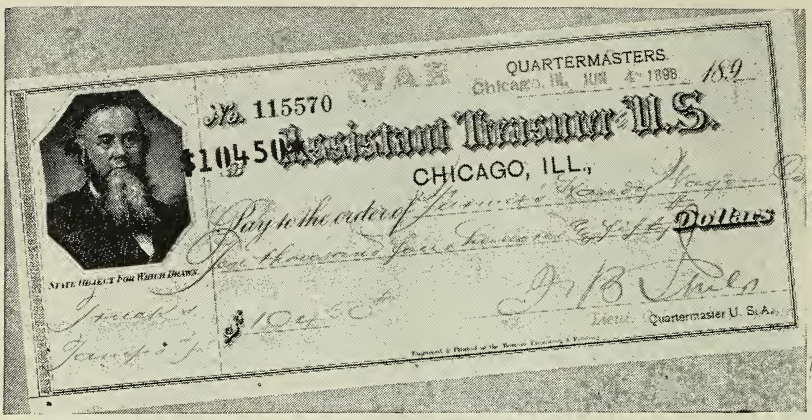

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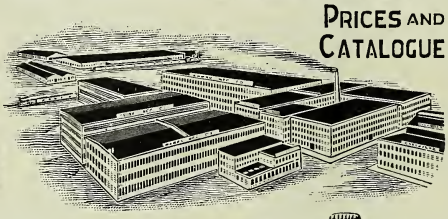

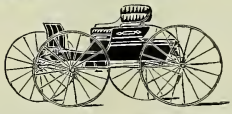

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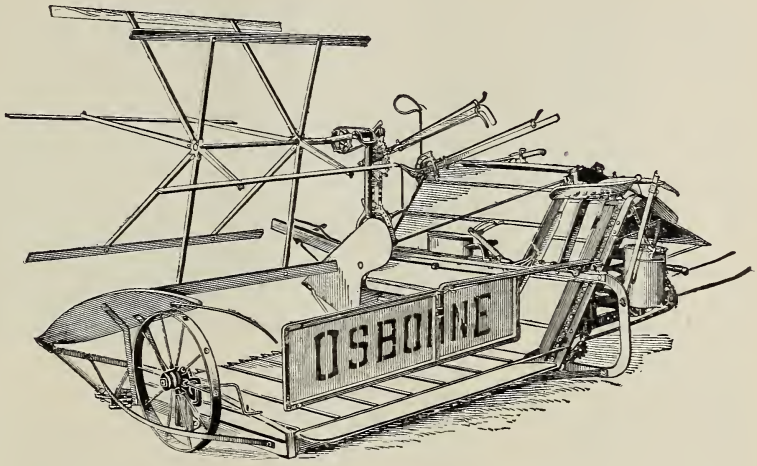

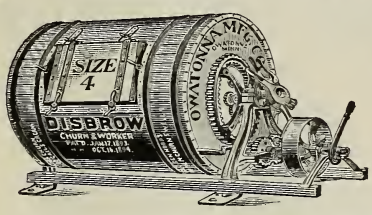

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N. Y. & Boston Ex.....	*11:40am	* 4:15pm
Cleveland & Buffalo...	*11:40am	* 4:15pm
Delaware & Cleveland.	† 4:15pm	† 9:10pm
Local to Cleveland....	† 4:15pm	† 9:10pm
Southwestern Limited	*10:00pm	* 7:08am
New York & Boston...	*10:00pm	* 7:08am
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(Cincinnati, South and West.)		
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Dayton & Cincinnati..	† 1:00pm	† 4:05pm
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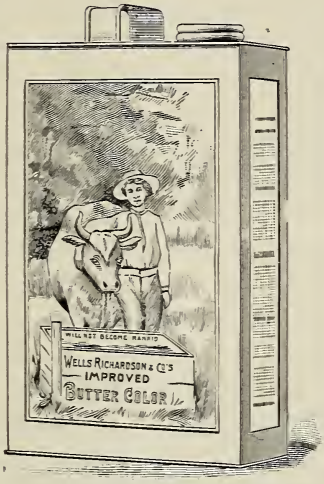

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Gluten Feed Contains 26% Digestible Protein.

That is why it forces the cow to give such a large flow of rich milk. The dairyman farmer has to buy digestible protein. He DOES NOT have to buy coarse feeds, as these are grown in abundance on his farm. If every dairyman farmer would buy Gluten Feed and mix with his course feeds, such as corn stover, hay, straw, etc., he would lessen the cost of production and increase his dairy profits.

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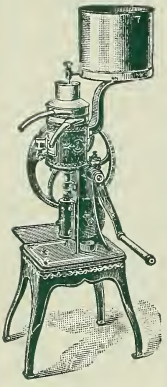

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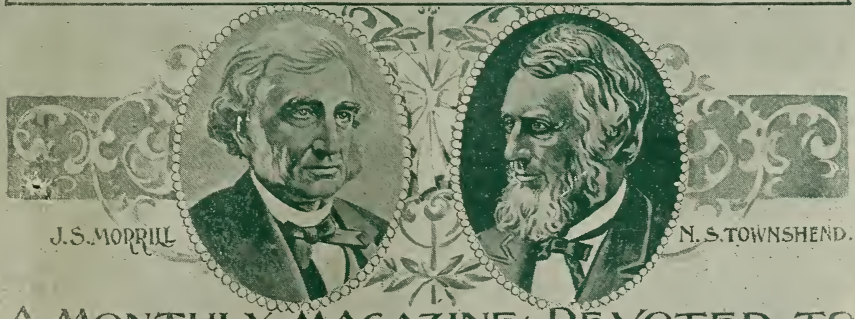

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THE ONLY TRIPLE CURRENT SEPARATOR, continues to prove its superiority over all others.

Reports of work done this winter (1899) at the Dairy Schools at the State Experiment Stations show that the Improved U. S. averages to do more thorough separation than any other separator.

The average of 19 consecutive tests of skimmilk, covering 10 days work in January, at the Ohio Experiment Station was .034 of 1%.

The average of 19 consecutive tests of skimmilk, covering 13 days work in January, at the Massachusetts Experiment Station was .033 of 1%.

The average of 18 consecutive tests at the Vermont Experiment Station from January 9th to February 3d was .038 of 1%.

The average of 17 tests at the Wisconsin Experiment Station from January 2d to 19th was .03 of 1%.

Making an average from 73 tests of skimmilk of .034 of 1%.

To show that it is nothing unusual for the Improved U. S. Separator to do such close skimming, we add a few of the many letters received from those using the machine every day of the year, by which you will see that it does equally good work in the Dairy and Creamery.

Runs Quietly. Skims to a Trace.

Phalanx, O., Jan. 27th, 1899.

The No. 1 U. S. Belt Separator that I am using runs very quietly, and in all my tests as to skimming, I have never found only a trace of fat in the skimmilk. As to capacity am satisfied it is equal to any.

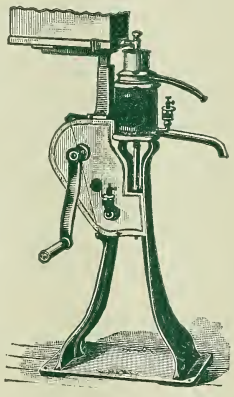
O. F. IVES.

Skims Clean and to Full Rated Capacity.

Sennett, N. Y., Dec. 21, 1898.

The two No. 1 U. S. Separators purchased last April have been running ever since and are giving the best of satisfaction. We are using four of your machines at present and have no trouble in making them skim up to their rated capacity and only leave .03 and .04 of 1% of fat in the skimmilk by the double neck bottle. The expense for repairs is very small.

W. E. SPURR,
Manager Sennett Creamery.



Seven Reasons Why He Likes the Improved U. S.

Mountain Lake, Minn., Feb. 6, '99

Since I am using a No. 5 Improved U. S. Separator on the Fairview Farm, will drop you a line to let you know that I am more than pleased with it. It is set up in the barn, and although the weather has been as cold as 35° below zero, still I find that it does its work and gives satisfaction, for:

First, it turns easily. Second, it skims so as to leave only .03 of 1% fat in the skimmilk as shown by the Ohlsson bottle. Third, the capacity is all that you claim for it. Fourth, it will skim as cold milk as any separator made. Fifth, my wife says it saves much labor and makes the care of the milk one-half lighter, and she can clean it in five minutes. Sixth. I have no trouble in flushing the bowl. Seventh, it is durable and easy to wash.

CHAS. McCROSSEN,
Manager Fairview Farm.

No Trace of Fat in the Skimmed Milk.

Tolt, Wash , Jan. 23, 1899.

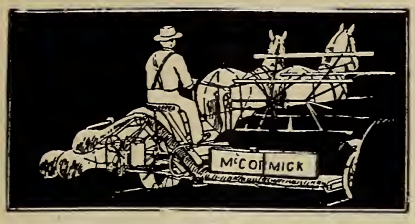
The No. 3 Improved U. S. Separator I bought of you May 1st, 1898, and used by the Tolt Separating Co., has given perfect satisfaction. We have tested the skimmed milk with the Babcock Tester often, and have never found a trace of fat in it. The cream we ship to the Duwamish Milk Co. has given perfect satisfaction.

G. J. ANDERSON.

For further particulars and information write for Special Dairy and Creamery catalogues.

VERMONT FARM MACHINE CO.,

BELLOWS FALLS, VT.



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McCormick BINDERS and MOWERS

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Easy to Operate,
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Light Draft,
Most Durable,
Work Perfect.

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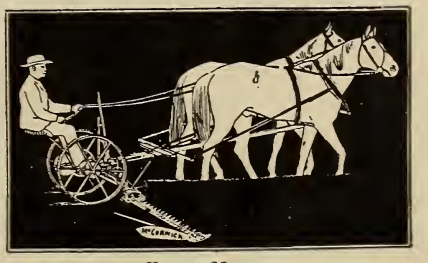

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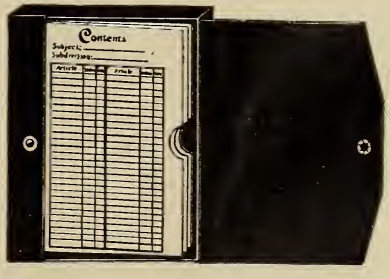

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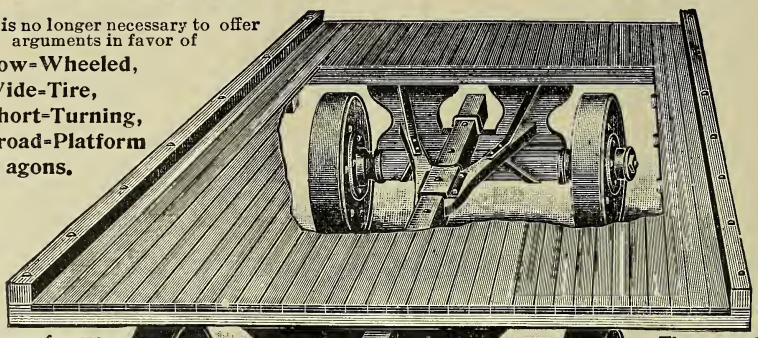

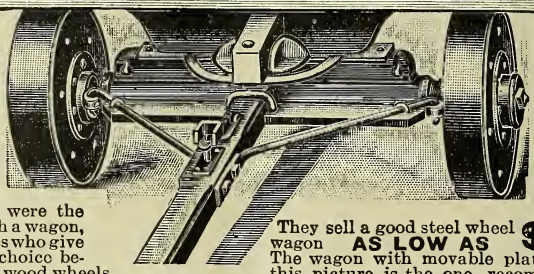

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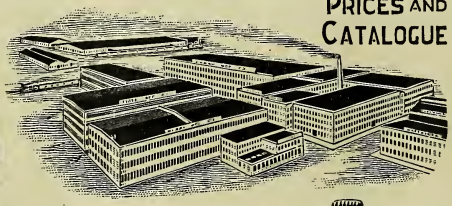

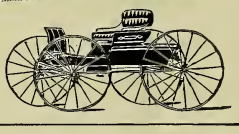

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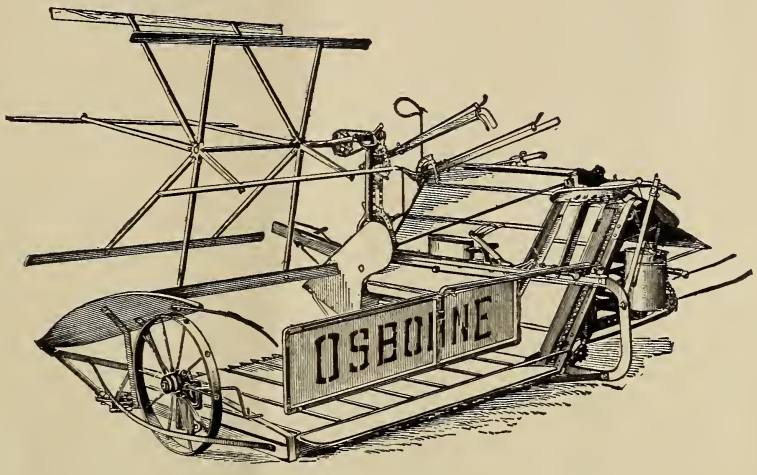

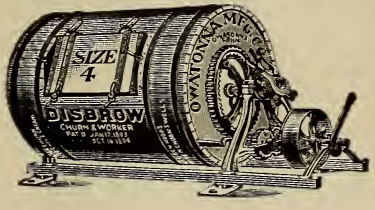

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New York & Boston...	*10:00pm	* 7:08am
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(Cincinnati, South and West.)		
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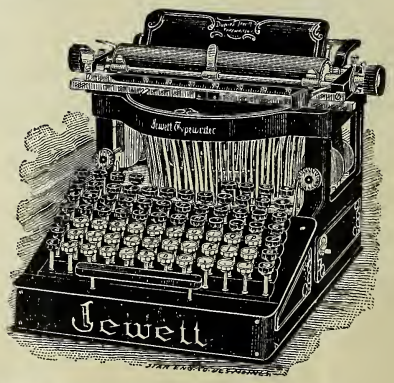

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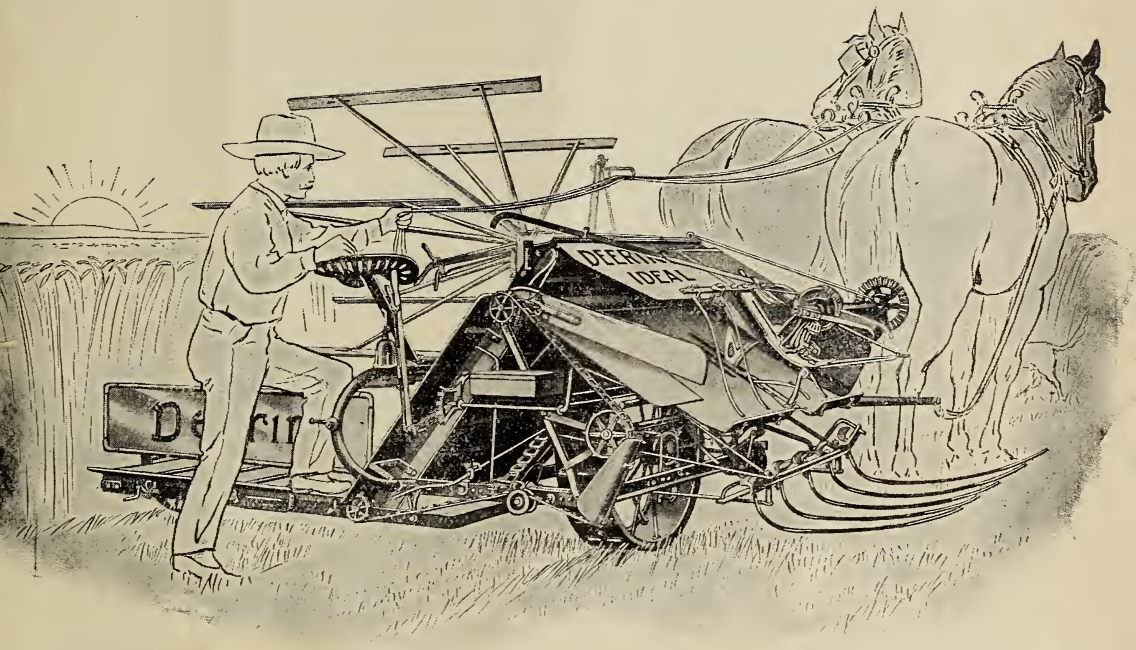

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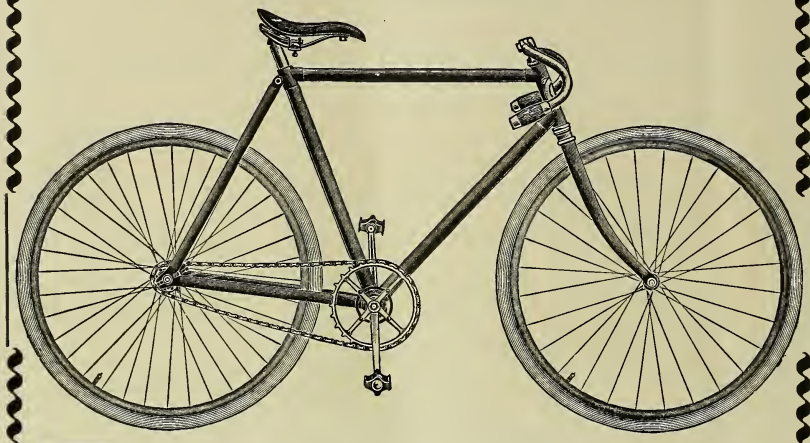

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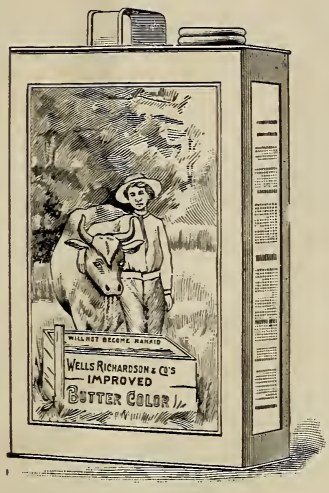

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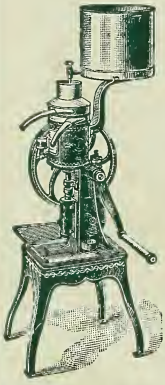

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